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THANKSGIVING WEEK

NOVEMBER 1918

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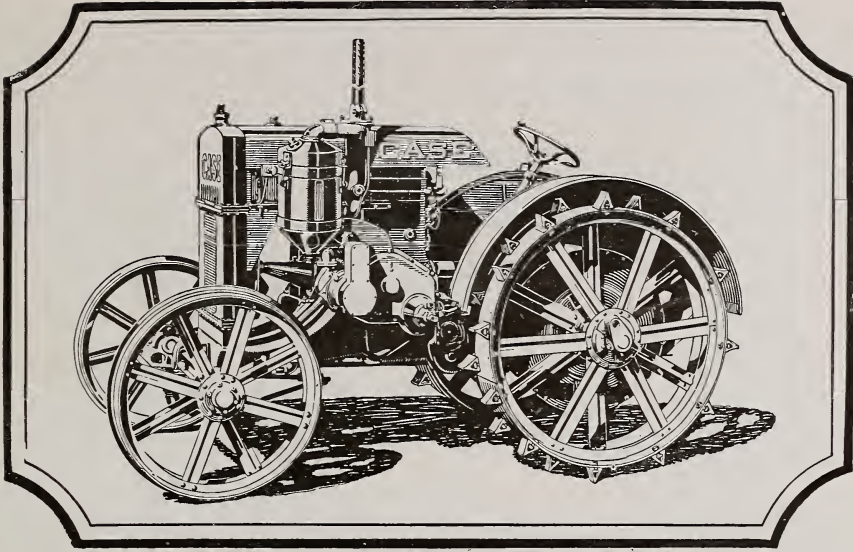
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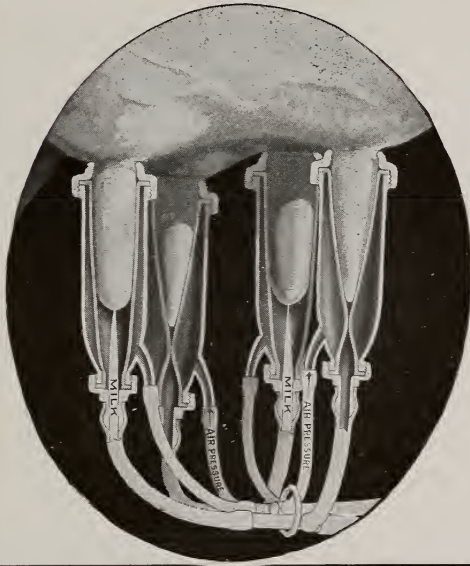
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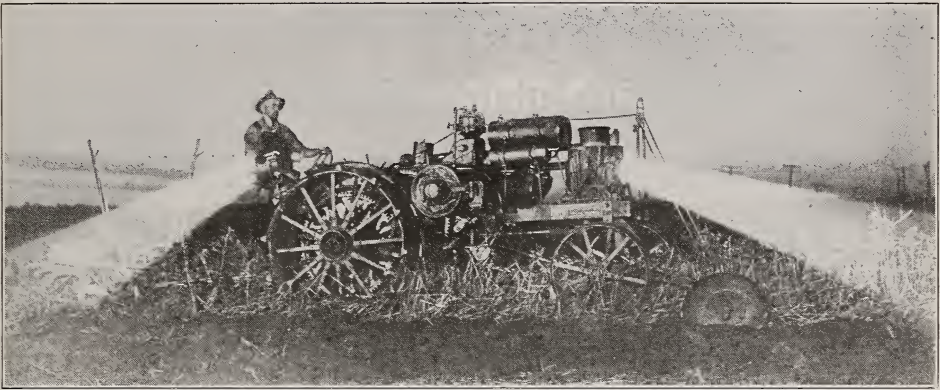
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A Thanksgiving Meditation

THESE are days when we are likely to go our ways with bowed heads, and some of us with hearts, as well as heads, bowed down, if not in grief, and depression, at least in serious thoughtfulness. It will not hurt us to be thoughtful and serious; but if we feel the war-time depression creeping over us, let us remember that fine old injunction from the service of the Church—"Sursum corda" "Lift up your hearts." Hearts were meant, I think, to be lifted up, in joyfulness, in happy thankfulness for the blessings of our lives, even while we recognize the presence in the world of terror and hatred and slaughter.

"It is a comely fashion to be glad," I have read somewhere; "joy is the grace we say to God." And there are multitudinous reasons why we should say that grace in a world and at a season where bins are bursting with grain, and orchards are burdened with fruit, where the woods are glorified with lovely color, and the harvests have filled men's hands with plenty. If it is true that the birds sing and build almost amid the thunder of the battle guns, surely women and men ought to be able to have happy hearts even in a world cursed for the time with the desolation of war. The very chance to act in generous unselfishness for the good of the world's unfortunates should be a source of gladness to those of us who are sometimes given to forgetting in our own happiness the misery of others.

There is no finer festival in all the days we celebrate than the one we call "Thanksgiving." Perhaps this is true most of all because it is a home-coming festival, even more than Christmas. It forms a center of attraction for all the genuine, sincere home interests; it emphasizes the beauty of the family affections; it warms all the rooms of the House of Life with its loving glow. Thanksgiving Day is a day of smiles and outstretched hands and glad greetings, a day of welcomes and of the bestowal of affection, a day of commemoration of our love for our fellows and for our Creator. Let us make it a great day, this year and all years.

WILLIAM L. GRAVES, '93,
Professor of English.

The Agricultural Student

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No. 3

SIMPLE WATER SUPPLY SYSTEMS

By H. C. RAMSOWER

(Prof. Ramsower is the head of the Department of Agricultural Engineering at Ohio State University, and is prominent in tractor matters in Ohio. He makes a strong plea in this article for relieving the housewife of some of the drudgery. He tells how one woman might have climbed Pike's Peak over one hundred and fifty times. His figures are significant.)

ON a farmstead in southern Ohio was a splendid spring which had been sending forth a gushing stream of water as pure and cold as one would care to taste. Springs have a habit of locating themselves at the foot of hills, while man builds his residence on the top; in this case the spring was fully a hundred feet from the house and thirty feet below it. The parents of the housewife then living on the farm had occupied the homestead for nearly seventy-five years and for at least fifty years the mother had carried water from the spring to the residence for household use. In the course of her life she had probably made an average of four trips per day to the spring, returning with a three-gallon pail of water. It requires but a little figuring to arrive at these astonishing comparative results—in fifty years this mother of many children had walked a distance equal to that from New York to San Francisco, while, at the same time, she had climbed a hill one hundred and fifty times as high as Pike's Peak, carrying twenty-five pounds of water. The energy spent in carrying the water would have loaded, by main strength, 226,000 bushels of wheat into a wagon four feet high.

A hydraulic ram which at the time of the visit was forcing a stream of water thru the kitchen every hour in the day had recently been installed in

this house. The total cost of installation was forty dollars. May I then put this question—who would be willing to carry a three-gallon pail of water from New York to San Francisco climbing en route one hundred and fifty Pike's Peaks for the munificent sum of forty dollars?

To what splendid purposes could this farm housewife have put the time so consumed! She could have trained her children, played with them, taught them many a useful lesson; she could have improved her own mind by reading and study, thus enabling her to meet and talk with women in other walks of life with more complete freedom and ease; she could have rested, and what a boon those few minutes per day spent in rest would have been to that woman. You say this is a mere fantasy? On the contrary, it is a plain statement of fact, and the instance might be duplicated on thousands of Ohio farms, differing only in degree.

THE POINT IS THIS

We fall into the habit of putting up with these so-called minor inconveniences, little realizing how much in the aggregate is being consumed, when often the expenditure of but a few dollars will eliminate the inconvenience and result in the saving of many dollars' worth of time.

A windmill and a few feet of pipe, at a cost of one hundred dollars or

thereabouts, will deliver water to troughs in barn and yards and save days of tedious hand pumping. If the well is near the house why not place a twenty-gallon tank on the kitchen sink and pump all of the water thru it, letting the overflow go to the barn. If the barn is higher than the house, the water can easily be forced thru the tank at the sink.

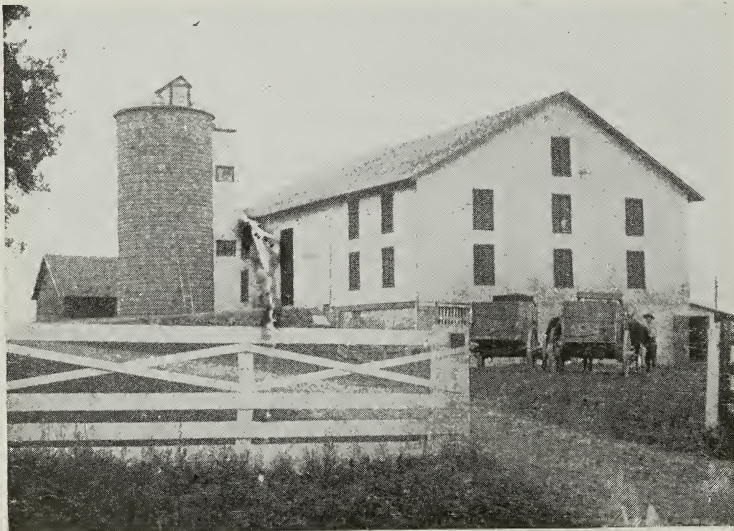
Too often barrels of water run from the roof of the barn and to waste, in fact, often accumulating in the barnyards and causing waste of feed and much inconvenience. A cistern built on top of the ground from monolithic concrete, cement blocks, or clay blocks, will afford a supply of water which can be drawn by gravity to barns, yards, and perhaps, to the house. Where such a scheme is possible, human labor, so far as the water supply is concerned, is reduced to a minimum. By careful planning, the size of the cis-

tern can be determined so that it may be suited to the amount of water to be secured from the roof and to the amount of livestock kept.

There may be a spring situated above the level of the buildings which, at small cost, may be piped by gravity to the place where needed. Of all water supply systems this is perhaps the best.

And let's not forget the house in our planning. Let's put in a kitchen sink and bring the cistern water into the kitchen. If the well is shallow and close to the house a well-pump might be put on the sink too. What an advantage to have cistern and well water at the sink, even tho both must be pumped!

Of course, we very much prefer the more complete pressure systems even tho they be more extensive. There are many simple ways in which our present methods of supplying water to either house or barns can be improved if the question is given a little serious thought.



THE CARE OF FARM MACHINERY IN WAR TIME

By F. W. DUFFEE

(Mr. Duffee is Instructor in Farm Machinery at the University of Wisconsin. He was a special student here in Agricultural Engineering.)

THAT a tremendous loss is felt every year by the farmers of Ohio due to improperly housed farm machinery is a fact that is well known by every one. But that a loss as large or even larger is incurred due to negligence and improper repairing is not so commonly realized. This latter loss probably amounts to a quarter of a million dollars annually. To allow this loss to continue in these times is little short of crime. Every effort is being bent to economize and save iron, steel, wood and labor for war industries.

The object of this article is to point out in a brief way some of the causes of this loss and their remedies.

The application of paint is one of the first essentials to long life in farm machinery. This job does not need to be a particular one to serve its purpose as a conserver of farm machinery. Bridge paint answers the purpose best as a universal paint for all conditions, altho any paint can be used. The machine to be painted should be free from dirt. A fairly large brush should be used to apply the paint.

A general consideration applying to all machinery, is to carefully go over it replacing the missing, badly worn or broken bolts and tightening up all those that are loose, and at the same time examining the machine for badly worn or broken parts.

THE CARE OF THE PLOW

The machines which are the source of the greatest loss due to lack of repairing are plows, mowers and binders, and these will be taken up separately and discussed. A plow should always have the scouring parts either greased or painted as soon as the season is

over. The largest saving that may be made in regard to plows is that of sending old steel shares back to the factory and having them repointed. Most manufacturers make a practice of re-pointing old shares for their plows, but it would, of course, be well to make sure the manufacturer of your particular plow does this work before sending them to him. A share repointed in this way can hardly be detected from a new one, and of course, fits and operates like a new one, which is a decided advantage over the work that even the best blacksmith will do, and the fee charged for this work is very small indeed compared to the service rendered. This is a very decided saving in both steel and money.

If the land side is badly worn, it should by all means be replaced. The heel of the land side in particular wears rapidly, and it especially should be in good condition in order that the plow may run properly and not have excessive draft.

THE MOWER REQUIRES ATTENTION

The mower is an implement that is very seldom completely worn out. A few, of course, have the frame broken, and this means a rather large cash outlay to repair it, and it is not worth it unless the mower is practically new. However, in many cases, a mower which is badly worn and works very poorly can be put in good running condition for many more seasons at the moderately small cost of probably ten to fifteen percent of the price of a new machine.

The gears, shafting and bearings should be carefully inspected first, and gears and bearings that are badly worn should be replaced. We usually refer

to the shafts of a mower by the following names. The axle is called the main shaft, the short shaft usually parallel to it and to the rear of the axle the secondary shaft, and the one driving the pitman the counter shaft. The main shaft runs on roller bearings and these will probably need no repair. However, there may be end-play between the wheel hubs and the washers on the end of the shaft. These washers are usually designed to take up this play, or if it cannot be taken up in this way, put in ordinary washers. The bearings of the secondary shaft should next be inspected, but these do not usually need repair. The bearings of the counter shaft, especially the one at the front end, wear rather rapidly. These can be removed after taking off the counter shaft. The counter shaft is removed by simply unscrewing the bevel gear at the rear; bearing in mind that this gear screws on in the direction in which it runs in operation. After removing this shaft, the bearings usually may be pulled with a small wire or iron hook. In putting in new bearings, be sure that the oil holes match before they are fixed in place. The bevel gears can be taken up in most machines by means of a nut on the end of the counter shaft, but if the gears are badly worn, they should be replaced. When putting in new gears it is especially desirable to have new bearings, particularly for the counter shaft. The new gears should be adjusted with the outside ends of the teeth of each exactly even, and they should lack about one-thirty-second of an inch of meshing to the full depth of the teeth. The large bevel gear as stated above, is adjusted by means of a nut on the end of the secondary shaft. The small gear is moved to give the proper alignment by means of washers back of it. These

washers should be of hardened steel unless a ball thrust bearing is provided, when ordinary washers will answer the purpose. A new pitman should be provided unless the one already on the machine is in good condition.

The cutter bar should be aligned next. By the alignment of the cutter bar we mean that when a string is stretched along the top of the middle of the pitman and extended out along the top of the cutter bar, the outer end of the cutter bar will lead the line by about one inch for a five-foot bar and one and one-half inches for a six-foot bar. This test should be made with the tongue propped up to its normal operating position. The drag of the bar when in operation is sufficient to bring it back to practically a straight line with this amount of lead. If the pins attaching the cutter bar to the frame at the hinge are worn, it will cause the bar to sag and become out of alignment. These should, of course, be replaced. If the bar still sags backward, some method will usually be found for bringing it up to alignment by adjusting one or the other of the brace rods that hold the bar in place.

The cutting mechanism is the next to be inspected. The cutting mechanism of a mower is exactly the same in its operation as that of a pair of scissors. It is therefore apparent that there are two cutting edges, and that these should be held together in some manner and that one of them rests flat on the other. The two parts of the cutting edge are the section and the ledger plate, the section, of course being the movable part, and the ledger plate which is in the guard is stationary. Worn ledger plates are, probably, the cause of more trouble in operation than any other one thing. These may be removed alone at a very small cost, if

the owner wishes to take the trouble of riveting in new ones. However, the guards are usually badly worn, too, and most men prefer to replace the guard completely. When removing either ledger plates or guards in part or in whole, care must be taken to have the top surface of all of the ledger plates even. This may be done by laying a thin straight-edge on the ledger plates and lowering the high ones by means of thin tin shims between the guard and the cutter bar. This is very essential to the proper operation of the machine, especially in hard going.

The rear of the knife is held up so that the sections of the knife will rest flat upon the ledger plates by wearing plates. In most machines these are steel plates some four or five inches long, spaced along the cutter bar. In at least one machine, each guard carries a wearing plate. If these become badly worn, the rear of the knife is allowed to drop down, thus preventing the tips of the sections from resting upon the ledger plates. This would be comparable, in cutting, to a pair of scissors that did not have the points coming together. The wearing plate also holds the knife forward to its work. If these are badly worn they should be replaced. In adjusting the wearing plates a straight knife should be put in and the plates moved until there is only a very small amount of backward and forward play in the knife. Great care should be exercised that the wearing plates are all adjusted to a straight line along the front edge.

When adjusting the wearing plates the knife head guide should also be adjusted. If the wearing plates are moved forward and the knife head guide is not, a broken knife is almost sure to result.

The knife is held down against the

ledger plates by clips. These are made of malleable iron or soft steel so that they may be bent down as they become worn. These should be bent until a very thin sheet of paper can just be drawn out from between the clip and the knife. The knife should, of course, be put in good condition and all broken or badly worn sections removed. This should be done before any of the adjustments are attempted requiring the knife in place. The last adjustment and one that is extremely important is to have the knife register. The knife registers when each section is in the center of its guard at the time the knife is at the extreme end of its strike each way. Having the rest of the adjustments properly made, the pitman should be lengthened or shortened as the case may be to bring the knife to register.

BINDER REPAIRING

The same instructions given for mowers apply to the comparable parts of a binder. It might be noted, however, that the bevel gears on the secondary and counter shaft are subject to extreme wear and very frequently need replacing, and care should be taken in their adjustment as noted above. The other parts of a binder which frequently are neglected in repairing, are the parts of the binder-head. The binder-head is not as difficult to repair as it might seem. The binder-head proper can be removed, usually without much trouble, by removing the nut on the end of the discharge arms shaft, removing the nuts that hold it to the frame and sliding it off the shaft. All of the parts of the tie mechanism can now be replaced very easily. The pinions on the knotter and twine disk shafts are pinned and can be removed very easily by driving out the pin. New springs

may be put in where needed. The cost of refilling a binder-head completely is a very small sum and when refilled, should last almost as long as a new machine. If there is much end-play in the twine disk shaft, a washer should be inserted usually on the end opposite the pinion, in order to have the twine disk come to the proper position to catch the twine. In replacing the binder-head, the nut should be drawn up until the flat parts of the pinions rest squarely against the bevel driving gear, but not tight enough to bind. The parts of the binding mechanism should then be adjusted about as follows: the twine disk on most machines should hold the twine so that a pull of about forty to fifty pounds is required to pull it free, but it should not be so tight that it cannot be pulled out without breaking. The bill hook spring should be adjusted tight enough to hold the twine for tying the knot. It should not be so tight as to snap loudly when the knot is pulled off. The twine tension should be just enough to keep the string from running slack. If tighter bundles are desired, the compressor spring, which is compressed when the trip lever is pulled, should be adjusted.

The clutch which drives the binder also frequently becomes worn and fails to operate properly. If such is the case, it should be replaced.

Any badly worn rollers should be replaced. Split rollers can frequently be repaired by bolting together, counter-sinking the bolt-head and nut,

otherwise it would wear the canvas. The elevator rolls should be square. This is most easily done by taking the two diagonals. They, of course, should be equal. If not, the upper end of the elevator may be moved forward or backward, as the case may be, by adjusting the braces which hold it to the frame.

Wheel bearings and the other parts of the binder should be carefully looked over, the reel repaired and adjusted so that it swings parallel with the platform, and the binder given a general overhauling and tightening up.

ORDER THE NEEDED PARTS

While the adjustments given above may at first seem somewhat complicated and obscure, yet with a little study of the particular machine at hand they can usually be worked out, even by those who are not at all mechanically inclined.

The repair of farm machinery should be started at once, the machines gone over carefully, and the repair parts needed noted and ordered immediately, and the machines repaired during idle days in the winter. It is especially important to ship in your old plowshares early in the winter in order that the companies may repair them during their normal slack season. Do not decide that you will repair your machinery and put it off probably until it is so late that it will not get done at all, but do it now.



BUILDING CONSTRUCTION ON FARMS

By K. J. T. EKBLAW

(Prof. Ekblaw is head of the Department of Farm Engineering at Kansas State College and is author of "Farm Structures" and "Farm Concrete.")

THE great importance that has been given to a number of materials and commodities of direct use and value in the prosecution of the present war, has resulted in attention being distracted from some other matters which are of equal importance but whose effect on the ultimate outcome of the war is not so clearly evident. Among these matters is the question of farm building construction during war times. Too many people, when considering war, visualize only soldiers, and guns, and projectiles, and powder. They are not farsighted enough to realize that to feed the soldiers, the workers who make the arms and ammunition, and even the food producers themselves, this food is not produced instantaneously, nor even continuously: it is produced at certain seasons, and store-houses are necessary in which this food may be kept until needed. The food-producers, who in the main are farmers, are working under abnormal conditions in that their production must be increased even tho labor and equipment are scarcer and more expensive than before. They must be comfortably housed if they are to do their most efficient work. Stock and machinery must be more carefully sheltered, because both are very scarce and valuable. Better equipment must be supplied to the farmstead, both that replacement of labor may be effected and that more work may be accomplished in shorter time.

FARM BUILDINGS AS A WAR FACTOR

Thus the analysis proceeds. Followed out, it indicates with accuracy and with startling clearness, just what an important war factor farm buildings

and their equipment really are. If every resource of the country is to be mobilized, farm buildings must certainly not be overlooked.

The War Industries Board has, until recently, given but little consideration to the matter of building construction on farms. In their regulations made last August, the construction of any farm building was practically prohibited. Permits had to be obtained, the applications for which were forwarded from place to place until they reached Washington. It can easily be imagined how rapidly such an application would be passed, considered, and granted, and how expeditiously the permit would be issued. In all probability the permit for the construction of a much needed corn crib would be forthcoming perhaps in the following summer after the crop was to have been gathered.

Recent regulations of the War Industries Board, however, have greatly relieved the situation. Under the new regulations buildings costing \$1,000 or less can be constructed without a permit, and repairs and extensions amounting to \$2,500 or less in value can similarly be undertaken. This makes it possible for dealers to carry fair stocks and for farmers thus to obtain what they need in the way of building material. It is understood that the interpretation of the word "extension" in the new regulations will be reasonable and elastic, so that a farmer, in building additions to his stock-feeding or grain-producing plant will not be hampered by unjust restrictions.

Much has been said about the neces-

sity of conservation for the immense quantities of farm machinery in the hands of the farmers of this country, and the importance of keeping up the standards and the supply in order that production be not hampered. Farm buildings are of the greatest importance, especially when the fact is taken into consideration that the value of farm buildings in the United States is over six billions of dollars, or nearly four times the value of all farm machinery. Such a valuable part of the nation's capital simply cannot be neglected, if the best interests of the nation are to be adequately conserved.

The duty of the farmer in this respect, then, is manifest. He should not permit his farmstead equipment to suf-

fer from neglect in a mistaken notion that to do without necessary buildings is a patriotic proceeding. Indeed, it may be the very opposite. For instance, a silo can be built which will hold a thousand dollars' worth of silage which otherwise might be worth only half as much or less; for beef-producing it is worth much more than corn stalks. Farm buildings must be maintained in a good state of repair, new ones must be built to meet increasingly strong demands for greater production, and it must be remembered that these demands will not cease with the ending of the war. Food production is the world work of the farmer. It will be more important after the war is over than ever before, and the farmer must be able to meet the world's demands.



FARM STRUCTURES

By FRED W. IVES

(Prof. Ives is in charge of the teaching work concerning farm structures in the Department of Agricultural Engineering, Ohio State University, and has advised many builders regarding the utility and sanitation of good structures. Prof. Ives points out the folly of building without consultation with a farm engineer who is trained to consider convenience and beauty.)

"I AM in trouble," said a young farmer. "I have a barn which was built in the wrong place. It has a concrete floor that is too good to destroy, for wrecking would be a necessary task were the barn to be moved to the proper site. The silo, which is of more or less permanent construction, is located so that I cannot build an addition where it will be convenient without cutting off desirable light and service passages."

He continued, "I can see now where the fee of a competent agricultural engineer or rural architect would not only have more than 'paid out' in convenience but in saving worry over my present predicament as well."

Here was a man, who is a leader in his community and a good solid type of farmer, brought to a realization of a definite need thru costly mistakes. At the same time he was willing that his experience be quoted that others might profit, knowing that such experience is dearly bought and cannot be well afforded by the business farmer at any time, let alone the present when we are busy producing food for our army and allies, giving aid to the various relief movements and loaning money to Uncle Sam.

THE "HAPPEN" METHOD OF BUILDING

We have been in the habit, when the need of a building became apparent, to build for present needs as cheaply as possible without thought of future expansion or possible changes in our methods of farming. The shed or barn was built in a given place either because the lumber was thrown off the wagon on that spot or because there

happened to be no trees or fences to interfere. The result is a hodge-podge of miscellaneous structures more or less out of repair because of their very number and flimsiness. The result is actually a higher ultimate cost than would have been the case were the buildings made permanently, with some attention paid to convenience and future expansion.

Any structure should be built to fit the need for which it was erected. It is as much a mistake to build too large as too small. In the one case economy is sacrificed and in the other, convenience. An altogether too common method of procedure is to draw a rectangle of a size chosen "by guess"; the space thus obtained is then divided into smaller spaces for stalls, alleys, stairways and pens. Now it happens that a horse or a cow or a bushel of grain or a ton of hay require a certain amount of space which is pretty definitely fixed, either by nature or by law or regulation. Therefore it is possible, with the proper data as to number of animals, quantity of feed and proper recognition of convenience, economy, sanitary regulations and limitations imposed by the material used in the construction, to plan a building that will exactly fit present requirements; further, if the plan is made in units, it may be expanded in the future without great expense for alterations.

BEAUTY IS RELATED TO CONVENIENCE

Aside from economy and convenience there is another side which too seldom receives consideration; namely, beauty. Now beauty is an abstract thing which can be secured sometimes by accident

but more frequently by design. Altho we may not know the principles underlying design, we are still able, when driving along a country road, to say that this place is pleasing to sight and that place is unpleasant. Strange to say, convenience and beauty are very closely related.

Structures with simple lines may be more pleasing to the observer than others with much ornament that is flimsy or misplaced. Trees and shrubbery are nature's method of softening lines and hiding what might otherwise be ugly. It is possible to make groups of shrubbery or vines transform the structure so that it appears to have grown on the site and seems to belong there.

The man who has the chance to start with a clear field for the construction of his farm buildings is indeed fortunate. He can then study out his needs and group the buildings with consideration of the size and type of his farm, his method of farming, probable crop rotation, direction of prevailing wind, water supply, drainage, view toward and from the highway, proximity to fields and to highways—in fact, all the things which go to make for the best possible arrangement. The majority are not thus privileged, as some buildings are already in place and are too good to wreck or too poor to move and must therefore be utilized as well as can be. Sometimes a fire gives a solution and offers an opportunity to rebuild on improved lines.

GOOD BUILDINGS ARE NOT NECESSARILY OVERHEAD EXPENSES

Many are inclined to look at the buildings as an overhead expense, that is to say, that capital expended on farm buildings pays no returns. This is a grave mistake. All other consid-

erations aside, the addition of a good group of buildings with pleasing surroundings will nearly always enhance the value of the farm many times more than the original cost of the structures. A man and his family are entitled to a good shelter which at the same time should be a social center and afford privacy. Were this family living in the city, the rent of an abode to fulfill these requirements would take about one-fourth of the family income. Does a farmer pay rent for the house in which he lives? Not directly. Then is not his shelter a part of the income derived from the farm? Certainly. Then capital invested in a home gives a direct return. His barns and out-buildings house his stock, thus affording them comfort and shelter which saves feed, a direct saving. His feed and crops are preserved and kept until a convenient time so that he may sell when the market is right thus returning him a larger profit. It has been demonstrated by careful experiments that paved feeding floors, covered paved yards and manure pits will save their cost in less than two years and thereafter yield large returns. Implement sheds often show a return as high as fifty percent per annum on their cost due to the saving effected in increasing the useful life of the machinery thus stored.

THE VALUE OF FARM BUILDINGS TWICE THAT OF LIVESTOCK

According to the census reports of 1910, the value of farm structures in Ohio was \$368,000,000, nearly twice that of livestock credited to the same state. The annual depreciation on these buildings is not less than five percent for all causes, meaning that each year a replacement must be made equal to \$18,400,000, and this just for

one state! Does it seem reasonable that this vast sum of money should be expended each year without some thought being given as to how it shall best be invested to give a maximum return with the least depreciation. We may only guess at the value of new construction other than that of replacing worn-out structures and those destroyed by fire or requiring reconstruction because of their unhandiness or lack of sanitary features. Take the item of silos alone. Indiana proposes to build 10,000 silos in 1918. At \$300 each, a figure far too low, this totals \$3 000,000. Are not the farmers of Indiana entitled to the best possible information on the subject "Silos" before expending this great sum?

Thus we may see that altho the investment of an individual farmer in farm buildings may not be very large, yet collectively the farming industry is a real factor in the building business. At the same time, less plans are drawn and details worked out than for the building end of any other industrial, commercial or public enterprise.

FIRE AND FARM BUILDINGS

Take for example, the fire hazard. In our cities, not only are costly fire-fighting organizations maintained, but in certain districts all buildings are required to be of slow-burning or fire-proof construction. Even these structures are then further safeguarded by automatic sprinkler systems and by patrols of night watchmen and alarm systems. The fire-proof or even slow-burning construction on the farm is the exception rather than the rule. Even the simplest chemical extinguishers are uncommon. The fire loss in rural districts is of course modified somewhat by the great distance between buildings.

By careful planning, both in the individual structures and the groups,

even frame buildings may be so constructed as to resist fire to a remarkable extent. Masonry silos may serve as fire barriers between groups of buildings. Concrete and masonry substructure may be made so nearly fireproof that, tho the superstructure be destroyed, the lower portion will remain undamaged and may again be utilized. Roofs may be covered with fire-resistant materials and thus save many a building from ignition by flying embers.

PLANS ARE EASILY CHANGED

Plans are graphical representations of the various features of structures to be built. A plan represents also the ideas of a person concerned with the construction of the building. Obviously it is easier to change the location of a partition on a drawing than with the materials of construction. Thus it is possible to arrange all parts of the structure in a satisfactory manner before proceeding with the actual construction. All parts are co-ordinated, as for example, the second floor must fit the first floor in such details as chimneys, stair cases, outside walls or other details which concern both floors. For accuracy, the plans should be drawn to scale, else we may find that the things which fit so well in our preliminary freehand sketches took no account of the thickness of walls, width of doors and windows and will not work out in brick and mortar.

From carefully drawn plans, estimates of materials and labor required may be made, thus making it possible to know in advance within reasonable limits the cost of the structure. If the cost is found excessive, readjustments may be made to suit the purse. This cannot be done when the haphazard method of building without plans is followed. Also if the future is considered, the structure should be

planned so as to allow for expansion. A friend once started to build a barn. He had fixed the size thirty feet by fifty-six feet as his limit for present construction. After deliberation, he was shown that this barn was too narrow for his purpose and that without doubt he should have to double the space within a few years. The result was a barn thirty-six feet by forty-eight feet, a standard width, costing no more, but with one-third more capacity under a gambrel roof. He has since added thirty feet to the length and now has a well proportioned barn, all built according to the original plan of expansion and is happy over the time and money he expended in plans. This is an instance the opposite of that given in the opening paragraph.

It is true there are men who plan and make mistakes, but usually they are those who believe that because grandfather's barn was successful, their's should be like it. They forget the conditions under which grandfather was obliged to work and that had he been equipped as in the present generation, in his wisdom, he would have constructed his barn accordingly. We must not forget that mechanical equipment, well selected, is taking the place

of man labor and that our buildings must be designed to use this equipment in an efficient manner. Instead of unloading corn into a crib ten feet high with a scoop shovel, we now dump the wagon and go after another load while the gasoline engine elevates the corn twenty feet into a crib requiring but half the foundation and roof area. Examples like this one may be cited almost without number.

Why not plan your buildings with someone who devotes his entire time to keeping in touch with the progress of materials, both structural and mechanical; who is familiar with all the little details that spell convenience and economy, and makes a study of the conditions surrounding the production of crops and livestock? This is only in line with progress, for one does not hesitate to go to a good physician or surgeon when he is in distress physically or a lawyer when he is in legal difficulties, or a banker when he needs financial advice or comfort. One does not hesitate to purchase fertilizer on the advice of the agricultural chemist or soils expert, even tho it costs more than the ton he wastes by neglecting the feed floor. Why then begrudge the small fee of the farm architect?



GUESSING IN LAND DRAINAGE

By E. R. JONES

(Professor Jones is the head of the Department of Agricultural Engineering at the University of Wisconsin. "A drain," writes Prof. Jones, "is no better than its outlet." Accuracy is necessary for any feature of the farm which is expected to last a century. He has done a large amount of work of real value in reclaiming land in his state.)

LAND drainage is no place for guessing. Tile drains are taking the place of open ditches. Tile properly laid lasts one hundred years. It is folly to put in a drain that is to last so long without spending a few minutes surveying its course and designing the details.

A drain is no better than its outlet. Be sure that you have an outlet. Don't guess at it. Even where it appears that there is a liberal fall, set up a car-

drained until it acquires a depth of more than three feet. This make-shift outlet may have to extend for ten rods or it may have to be twenty rods long. It should not be guessed at, however. Before a spadeful of earth is dug, it is best to know how far the open ditch will have to extend before it is safe to lay tile.

Give every area a "once over" survey regardless of how much fall there appears to be. Whether the area is



Students laying tile on the College farm, University of Wisconsin

penter's level if you have no other, to prove that there is a fall. It may be that for a few rods above your neighbor's fence or above some other point selected for the outlet, that there is not enough fall to permit the laying of the tile three feet deep. In such cases, an open ditch must be dug as a make-shift outlet making it almost level and extending toward the higher land to be

hard to drain or whether it is an easy proposition, a few readings with a carpenter's level, or any other level that is convenient, will tell the story. An area may appear favorable yet this "once over" survey may show that appearances are deceptive. The time to determine this is before the work has started.

In a survey for a drainage system,

the effort should be to find the spot which is hardest to drain. This is usually a low spot some distance from the outlet. A main tile designed to accommodate this low spot will surely accommodate any other spot in the field.

It is safe to lay out the main on any area as soon as it has been proven that there is a liberal fall. The next step is to lay out the laterals. Where laterals are to be parallel, make them exactly so using a tape measure to determine the perpendicular distance between them. Don't guess at it. It is safe to guess the direction perpendicular to the proposed lines of tile, but enough judgment can be used to make the guess a very good estimate.

If the "once over" survey with a carpenter's level shows the fall to be limited, put the carpenter's level on the shelf. Get a surveyor's instrument for the balance of the work. Take enough level readings to show the topography correctly. This means a reading wherever it is apparent that the slope changes. Even where the slope does not appear to change, it may be well to take an extra reading to prove the uniformity of slope. It does not take long to get over a forty-acre field taking readings even one hundred feet apart each way, but such frequent readings are not generally necessary. With the topographic survey made, sketch a drainage system that seems to fit the land, staking out the main and a few of the laterals roughly. As a check take a few level readings on these lines to prove that they are feasible. Make slight changes in the directions of the lines where necessary, and then make a working sketch of the adopted plan. Number each line of tile on the sketch for the convenience of the workmen.

Give the workmen a statement of the depth wherever the slope changes on each line. If these points are not over three hundred feet apart, that is generally sufficient. Where the distance between these important points is more than three hundred feet, it is best to set a hub at an intermediate point and give the workmen a statement of the cut at this point also. Many tilers prefer to have the cut given them every one hundred feet. This is a commendable plan. In any case, it is unsafe to depend upon water flowing in the trench as a guide to the depth where the fall is limited. The inevitable result is that too much of the fall is used near the outlet and the upper end of the line has to be laid almost level, or else too shallow to be safe. Where there is no water in the trench even with a liberal fall without grade laths properly set, humps or sags are apt to be left in the bottom of the trench. Let the tiler set several grade laths based on the depths given him by the engineer, and he can use his sighting stick to detect any irregularity in the grade line.

Guessing at the proper size of tile is unpardonable. Nothing smaller than five-inch tile should be laid even for laterals. A five-inch tile requires so more labor than a four-inch, and its total cost is only about fifteen cents a rod more than the cost of four-inch tile. The five-inch tile is the cheaper from the standpoint of value. The main tile should be large enough to carry from one-fourth to one-half inch of water from the area in twenty-four hours. Many of the College bulletins on drainage give tables showing the size of tile necessary to meet this requirement on different areas. Use such tables as a guide to your judgment.

(Continued on Page 190)

ELECTRICITY ON THE FARM

By F. J. ST. JOHN

(Mr. St. John is associated with the educational department of the Domestic Engineering Company, Dayton, Ohio. He makes a strong plea for the elimination of the human treadmill. Electrical service is the topic discussed in this article; the items of current consumption, cost of operation and upkeep being of minor importance compared with service rendered.)

OUR world combat with hunger of the past few months, has been a race with time. When our government took up the battle with hunger for so great a part of the world, it did so with a full understanding of the conditions which attend a fight with such a foe and with the realization that our efforts

for a long time the only farms that could employ it were those located along the scattered power lines stretched here and there across the country.

THE HOME ELECTRIC PLANT

But within the past two years or so, many thousands of small, individual electric plants have been developed for



No pumping—just turn a faucet to water the stock

to produce food must go forward smoothly and with speed.

Many short-cuts and time-saving devices have been employed in this speeding-up of the work of the farm and one of the important forces to be called into service is electricity. This is one of the newer agencies, as far as farm work goes, but the results where it has been used have been most gratifying. It had long been recognized that if electricity were only available, it would have met certain labor conditions on the farm most effectively, but

use on the farms and these are being employed to furnish electric service as complete as that enjoyed in the average city home. These electric plants, for the most part are made up of a small gas engine, an electric generator, switch board and storage battery. Those most commonly used are of low voltage, thirty or thirty-two volts. This is practical for serving groups of farm buildings and it means a decided saving in the expense of the storage battery, since only fifteen or sixteen battery cells are required compared

with the fifty-five or fifty-six needed in the 110-volt plant.

The modern tendency is toward the direct-connected plant, that is, with the engine and generator built into one unit, rather than with these belted together, as was the style in the earlier days of lighting-plant construction. A strong effort has been made to have these plants as simple and as practical in their operation as possible and some splendid results have been realized. Some of the plants are air-cooled, a few use kerosene, instead of gasoline, for fuel and most of them are self-starting.

As one manufacturer puts it, "We want the farmer to forget about the lighting plant and think only of the electricity and the service it will render." And it is this service which has played a considerable part, in many thousand farm homes during the past several months, in relieving labor conditions and in adding to the available supply of working time. Everybody who knows anything about farm life knows that farming is more than going into the field with a team and working so many hours a day. That is just what one does after all the bothersome incidental jobs are done, or before the chores, in the evening, are commenced. It is in these chores, the bothersome incidentals, that electricity helps out so immensely.

UTILITY OF THE POWER PLANT

One of the most important of these is that of supplying the water for stock and household use. Electricity will provide the power for a pressure water system that is absolutely automatic and that will furnish the water needed for all uses, at the house and the barn, just by the turn of a faucet. Many farmers testify to a time saving of as much as

two hours daily from the use of such a system.

Where dairy cattle are kept in any number, electricity can be used to splendid advantage to run the milking machine. It is being found worth while, from the labor standpoint, to get away from hand milking. It is work which is hated by most farm hands and by the boys and girls, who are always expected to help out with this particular chore. A saving of an hour or more may reasonably be expected on each milking, besides the actual labor, with even a small herd. One dairyman in Ohio recently told the writer that their saving was four hours a day, in the dairy barn alone, thru the use of the electric-driven milker and the electric lights.

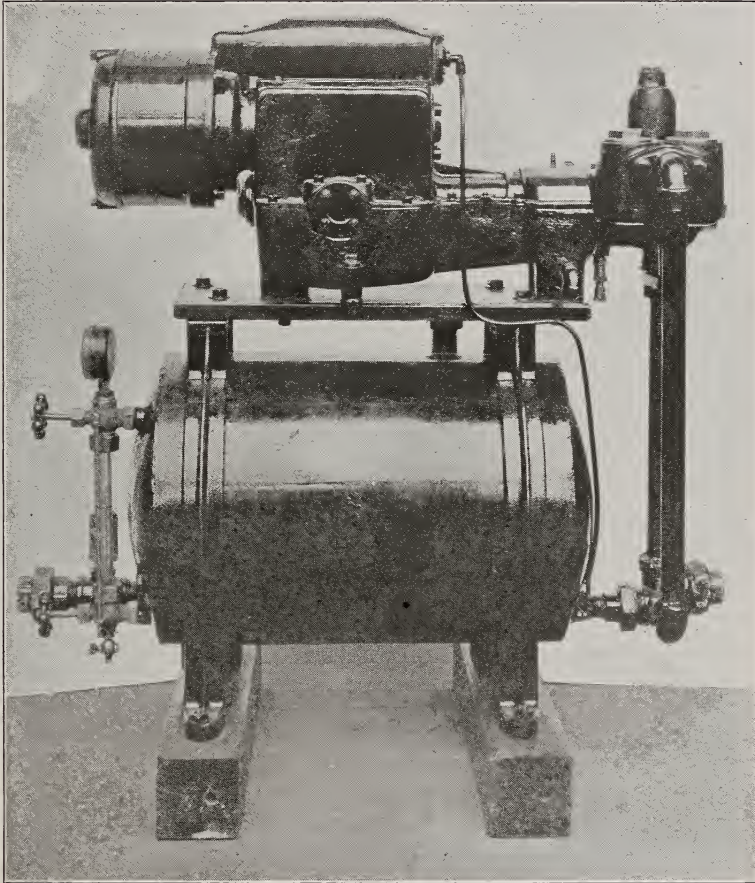
These are jobs that stand out because they have to be met in some degree, on practically every farm. There are other jobs that have to be done regularly, in which a small electric motor can be made to play a most valuable part. Take work like separating the cream, churning, washing and the like. As these operations are ordinarily performed, the whole time of one or more people is employed until the work is done. With an electric motor, on the other hand, the washing machine or the churn can be started, it will run along by itself for twenty minutes, a half hour or whatever time is necessary, before the human touch must be introduced again. That half hour will suffice for feeding the chickens, clearing away the breakfast dishes, putting up the children's lunches or other work that can not well be done by machinery. Then, besides the time saved there is also the saving of actual physical labor from the tiring, often exasperating work of turning a crank or lever. No

sort of labor is much more trying.

Then there are occasional jobs like running the grindstone, feed cutter, horse clippers, sheep-shears and the like, where no regular saving can be calculated, but where there will be a saving, nevertheless, always in labor

sheep quicker and more easily than he had ever done before.

Of course folks on the farm are not rebelling against labor of any sort, in these days, just because it is hard work, but they are awake to the necessity of making their efforts count, of making



A complete pressure water system. Quarter horse power motor, capacity 275 to 350 gallons per hour

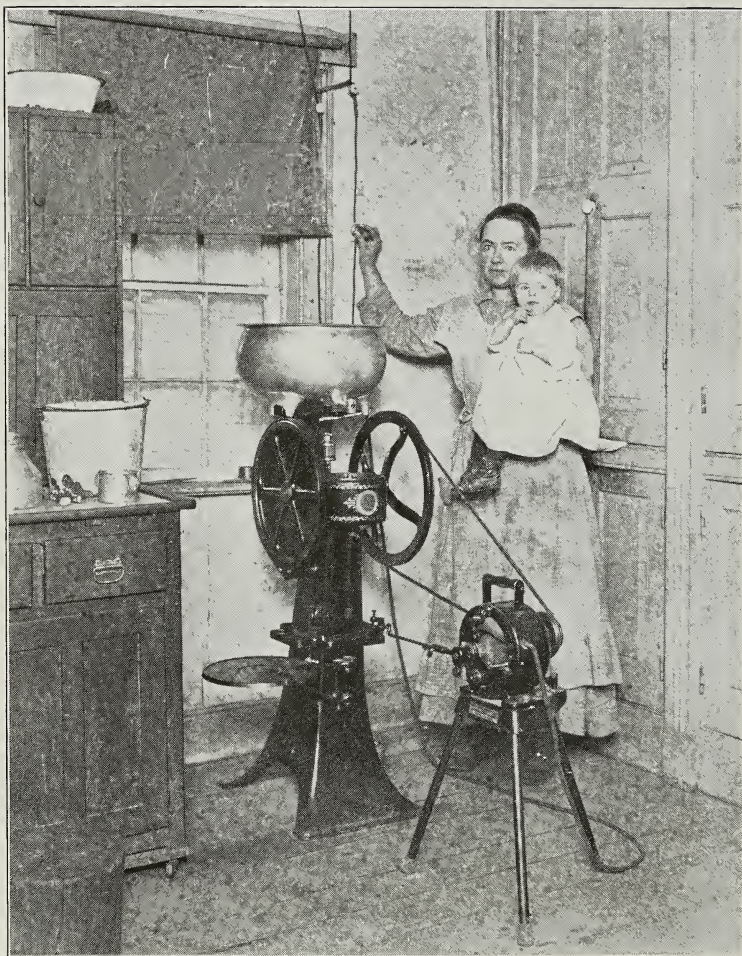
and very often in time. Often one man, with a little motor can run a machine, relieving another man who would be called on, otherwise, to turn a crank. A man in a western state wrote us that this spring, by means of his small electric plant, he ran his sheep-shearing machine and sheared 1,500

every hour's work contribute, more than it ever did before, in a good, honest, productive way toward the one goal for which we are all now striving.

Farmers who are using electricity do know, and their neighbors are coming to realize, that the use of electricity on the farm will save them time. It is

easily possible to save two or three hours a week on the family washing, where an electric motor runs the machine. As much more can be saved in operating the cream separator, for it must be run twice a day, and half as much on the churning. Then there will be a considerable saving in the use of

the other appliances suggested above and it will readily be understood that here are hours saved, maybe ten, twenty, thirty, who knows—hours that can be diverted from the time-killing jobs of turning cranks to profitable labor with crops, livestock and in planning and supervision.



Electric power to run the cream separator saves time and labor

such devices as the electric vacuum sweeper, the electric flat-iron and possibly some others.

Add the figures given for the saving on an electrically-operated pressure water system, on a milking machine, and

We must not overlook one of the most valuable influences that the introduction of electricity produces on the farm. This is its effect on those who do the farm work. Where the farmer must depend on hired labor, men or

women, it will be found easier to get and keep them if the farm home is equipped with the labor-saving devices that electricity operates.

HOME-LIKE CONDITIONS DEVELOPED

And if these things affect the hired labor situation, just as surely they affect the farmer's family. This is true particularly of the boys and girls. Our farm communities have lost too many of their young folks in times past, because they got to comparing their own working and living conditions with those of the city—and chose the city. The farm home where there are good lights, modern bathroom and power machinery to take the drudgery out of washday, out of the milking and the other routine jobs that go to make up the round of the daily work, has at least an even chance to keep its young folks in love with the farm and to hold them there. Without these things the odds are against it.

As to the wife and mother, probably she will not leave the farm for the city—at least she will not desert her post on the farm, even if there is no modern equipment, but she will be able to work more efficiently, to make her labor count for more, if she is able to work amid modern surroundings. For these things mean better health for mother and for the others. They give mother more time of her own and they give her a sense of well-being and of satisfaction which are worth dollars—and something more than dollars.

LET THE FARMER RETIRE ON THE FARM

The influence of electricity affects everyone about the farm premises. While the farmer is young and active, he may be content to drive ahead, with his modern farming implements, without much thought as to the influence of electrical conveniences upon the home. But as the years pass he will come to

think of retiring to the town or city, unless his farm home can offer comforts and conveniences like those that attract him toward the city home. It is worth while to have the elderly farmer retire *on the farm* rather than *from* the farm. The man who has spent a lifetime of usefulness in productive labor in the farming community and who has become a specialist in one of the most important vocations of the ages, cannot leave that community and that work without causing a loss to that community. Some one has depended upon his example, or upon his advice and these are gone, once he takes up his residence elsewhere. So it is important that we keep our elderly farmers satisfied with the farm and content to end their days there. Modern electrical conveniences are becoming of continually increasing value in helping to bring this very condition to pass.

And while the farm electric plant is a most effective combination of gas engine, generator and storage battery, let's not look upon it as a mere mechanical combination of steel and copper and glass. Let us rather regard it as a means of transmuting a valuable force, electricity, into service, service for the farm family, service in the form of light, heat, power, of time and labor saving and of relief from toil. Let us remember, too, that living efficiently on the farm lies largely in making the most of all the possibilities there, in making the best possible use of the time accorded us. And let us finally reflect seriously upon the question of the wisdom of using precious time in turning cranks by hand—in acting as human treadmills—when such effort can so easily be replaced in the modern way, by electricity, with human labor released, at the same time, for work that is vital and in unprecedented demand.

THE TEACHER TO GUIDE FUTURE FARMERS

By EUGENE W. BUDD, '17

(Mr. Budd is teacher of agriculture in the Chagrin Falls High School. He has written a most inspiring article which should be read by every teacher of agriculture.)

WHO can conserve the army of country boys which is moving cityward? This question is confronting the American people. The boys of the rural communities are dissatisfied with the old style of farm life. This class of boys hear about the "New Agriculture," but they do not understand what it is or what it can do for them. The agricultural course, as outlined by the Smith-Hughes law, has entered the field as a champion of the country boy and will be a strong force in stopping this withdrawal from the country. The boys must be taught that farming can be operated on a business basis. This is best done thru practical projects. Instruction in scientific farming opens up a new sphere to the boy. He perceives the practicability of a course of study which links up the theory advanced in the class room with the actual working out of the agricultural problems in his laboratory, the home farm.

In the past, the one year agricultural course has not proved a success, due largely to the lack of preparation on the part of many of those persons who have presented the subject and also to the impossibility of covering the vast field of agriculture in so short a period of time. The Smith-Hughes law provides that the agricultural teachers shall have a thoro education in agriculture, as well as methods of teaching the subject. In addition he must have had some practical experience on a farm. Having fulfilled these qualifications, the instructor can readily project himself in the place of the farmer and appreciate the problems arising under normal farming conditions.

America's part in this world struggle has taught us that we must practice conservation of time, effort and resources. The educational system is being reorganized to meet these demands. The field of agriculture has to deal with one of the most urgent needs growing out of the war, that of increased food production. The members of the agriculture class feel at once, that they are fitting themselves for some definite branch of war service. This phase of vocational education is the answer of schoolmen to the demands of the modern economic world, that boys and girls be taught in terms of their life work. The purpose of the four years agricultural course is to train boys in a definite way for a specific work.

These young people will graduate after four years of study with a capital of practical agricultural facts, which they can use in starting their life work. Many agricultural problems have been worked out by them, not merely on paper, but with real labor. Most important of all, they have seen results, which are the most convincing factors even in the larger school of experience.

THE TRAINED MIND AND HAND IS MASTER OF THE DAY

In this day of specialization, the provisions of the Smith-Hughes law are making it possible for the country boy to hold his own in the field of competition of the economic world. The agricultural course is training the boys in farming pursuits, in the same way that the military authorities are fitting the men in the service for some skilled mechanical work. Looking toward the reconstruction period which will follow

the war, one will see that it will be the man with the trained mind and hand who will be master of the day. Therefore, it is the duty of every country boy to avail himself of the advantages for self improvement and efficiency, offered thru the establishment of agricultural teaching in the high schools thruout the state.

THE FUNCTION OF PROJECT WORK

By means of the supervised project work, the teacher becomes acquainted personally with every boy in his class and in this way is able to get a clear understanding of the boy's home environment. This phase of the work is very necessary, as the teacher must know under what conditions the boy is working at home, in order to suggest means of improvement and to counteract by words of encouragement the opposing home influences.

The project plan is worked out on a purely business basis, which will appeal to the average father who wants his boy to advance. The land for the project is rented from the father, as well as the tools, horses and all other necessary equipment; therefore, when the boy has completed his work, he will know just how much money he has cleared, over and above his labor and expenses. The idea of ownership accomplishes wonders for the boy, for the plot of ground used will, at the end of the season, show the results of his labor and expenditure of money. The work accomplished will be more effective than a mere report card containing his grades.

Project work is an actual extension of the laboratory period lasting thruout the summer. This work is carried on under the supervision of the instructor, who is on hand to answer the questions of the boy and to see that the theories advanced during the school term are carefully understood and ap-

plied. By means of repeated visits to the boy's home, the teacher gets acquainted with the father and in time is able to win his confidence. While the agricultural instructor is supervising the boy's project work, he can make mental note of some of the conditions on the farm which need changing. This material can be used as a basis for his classroom discussions, thereby presenting the object lesson without personal offense. Even chance remarks in the classroom often bear fruit, as was proved to me the other day when calling upon a boy who was working with his father in the apple orchard. The father greeted me with this statement, "John was just saying that he



Practical lesson on a wild apple tree

did hope that you would not come before he had an opportunity to trim his trees, as he did not want you to see them in this condition." A recitation of a few days previous stressed the necessity of keeping the trees in first class condition.

PROJECT WORK STIMULATES THE FATHER

The Smith-Hughes courses are many-sided and tend to develop the various phases of the boy's life. For example, the boy's initiative is awakened in the work of stock judging teams. The pig, poultry and corn contests encourage honest rivalry among the various school districts. The training along business

and commercial lines can be given in the planting and marketing of berries and vegetables.

All these activities will indirectly arouse the interest of the father; for when he sees the efforts of the boy to raise stock according to the most advanced methods, the father will at once begin a self examination of his own system and he will use the suggestions of the teacher of agriculture, as a measuring rod. Therefore, these practical lessons in farming are often more effective than articles read in the farm papers. This fact was brought home to me in the case of one member of my class in horticulture who questioned his father's method of grafting apple trees. I was called to the orchard and helped the boy graft several trees, applying the information he had gained in the class work. The result was that the father's grafts failed, while those of the boy's grew, thereby presenting to the father an object lesson. Another concrete example can be pointed out from the pig contest work, when the boy's pigs were found to be gaining over a pound and a half a day. The father would not at first accept this verbal statement and the pigs were weighed in his presence and the records up to date shown him, which were so convincing that the father asked his son to use the same methods of feeding balanced rations to his own pigs.

Thru the boys in the school, the keeping of account books of farm business has been started on many of the farms. The laboratory exercises in testing for butterfat have aroused the boys to keep records of their father's herds. This work has been followed by a personal interview with the students at the end of each month, going over the record sheets in order to determine as the case might be, a profit or loss for each cow.

The results served as an eye-opener to the father and in many cases he sold the boarder cows. With a little help now and then in weighing feed and in going over the results, I think the boys will continue this work and be able to build up better herds in the future.

VISITS TO MONEY MAKING FARMS

The class can be shown that farming can be made a paying proposition by field trips to fruit and dairy farms, the owners of which will tell the boys the amount of money spent for improvement and what dividends were realized from this expenditure. In a recent visit to a fruit farm of four hundred and fifty acres, the boys were shown that money can be made thru the utilization of ground for intertilled crops of strawberries, corn and beans. When the boys are told in these informal talks by the managers of farms what the net profit of each crop is, the boys will be convinced that money can be made providing the right methods are used. If the boys see that record-keeping is an index for the owner of a large dairy, the boy's initiative will assert itself and he will endeavor to find out whether, or not, his father's herd is paying for the feed given and the capital invested. The boy's insight into the relative merits of cattle, developed by means of judging contests, will cause him to suggest to the father, that the scrub cows are a dead weight and should be weeded out, if the dairying business is to be made to pay.

THE FARM BOY IS A DEMONSTRATOR

The agricultural instructor can use the influence of the classroom as a connecting link between the school and the industrial needs of the community. The activities of the school laboratory are, so to speak, practical demonstrations to the community of some of the modern scientific methods of handling

farming problems. For instance, test plots of wheat, oats, corn and potatoes can be used to show what varieties are best adapted to the particular community. The class in soils can also convey some very useful information to the farmers because of their experiments. A reform in the present methods of fruit growing may be brought about thru the practical demonstration, by the class, of planting, spraying and pruning of orchards. The cultivation of crops new to the community, such as cowpeas, soybeans and alfalfa, can be introduced thru project work. An awakening of civic responsibility may be brought about by getting the boys to make a careful survey of the local milk supply, both thru laboratory testing and visits to milk dealers' farms. The aesthetic features may be emphasized in the model plans; landscape gardening being worked out by the boys in beautifying the school grounds.

In the capacity of a servant of the public, the agricultural instructor finds many ways in which he can be of use to the district. For instance, we had a farmer in our community last spring who was more interested in seeing money come into his coffers than in considering the welfare of his neighbors. He sold over one hundred bushels of seed corn which he advertised to test 100 percent. It was thought wise to look into the matter, and after much urging one purchaser of the corn was persuaded to let us test it. After the test the latter was called in and asked why he was going to plant corn when only twenty percent of the ears would grow altho all of the corn had an equal chance in the tester. After several tests of this corn, the other purchasers were notified thru the local paper. The result was that in most cases this

high-priced corn was used as feed. Services of this kind will lead the farmers to have confidence in the official who has been placed among them. This and similar incidents will cause the farmer to think in terms of dollars, and thus he will readily see that the agricultural teacher is worth his salary. The Smith-Hughes agricultural laboratory is the clearing house for all agricultural problems of the community.

Altho the farmers represent nearly one-half the population of our country, they have only a very limited organization for furthering their interests. It is the hope of all agricultural leaders, and the point to which they are working, that a network of communication for the rural districts shall be built up with the county agent acting as the chief operator and the other men in the service as outpost receivers. This system will serve the purpose of bringing knowledge of the latest methods and best working facilities to the farmer, as well as the current bulletins and information sent from the extension department of the Ohio State University and the various experiment stations. This can be accomplished thru the hearty cooperation, with the county agent, of all Smith-Hughes men and leaders of the farmers' organizations. Thus able speakers can be secured and by means of demonstrations, exhibits, lectures, motion picture films and personal interviews farming can be placed on a high plane among the other skilled professions where it rightly belongs.

"Whoever makes two ears of corn, or two blades of grass, to grow where only one grew before, deserves better of mankind, and does more essential service to his country than the whole race of politicians put together."—Swift.

FARM LABOR AND MECHANICAL POWER

By G. W. McCuen

(In this paper, Prof. McCuen of the Department of Agricultural Engineering, O. S. U., discusses the great source of power by machine labor during this serious situation of labor shortage. Prof. McCuen has done much to familiarize the farmers of Ohio with the real merits of tractors.)

THE war has brought to the American people many difficult problems. The manufacturer, the merchant, the salesman, all think their problems the most perplexing, but, to my mind, the farmers' problems are far more difficult to solve. He has to depend entirely upon the sun and the rain to grow his crop. At present, his row is not an easy one to hoe on account of labor shortage, caused partially by the draft and partially by the lure of the higher wages paid by the city industries.

The problem of increasing the food production is indeed a serious one. The farmer has been entreated to plant a greater acreage and produce more bushels per acre. He has responded nobly, but he has reached the limit of endeavor, due to the two limiting factors—help and time.

With our present day farm equipment he is able to do just so much and no more. The horse power that he is able to control as a unit is probably a maximum of six horses (more often four or five) as a hitch. His labor output is limited by the power unit under his control.

THE MODERN WORLD IS RULED BY POWER

Power controls our modern world, and since the dawn of history it has been the dominating influence in the transition from savagery to civilization. The human race has always required power for the three great essential purposes: agriculture, manufacture, and transportation.

The tiller of the soil, in all ages, has surpassed his contemporaries in adapting animal power to human needs either

in the arts or in commerce. He is thus the last to feel the need of a change to mechanical power, and so has escaped the final stage in industrial revolution. But he is now about to complete the cycle. He has come to the point where the methods of the past will no longer suffice if he is to keep pace with the other factors in the world industry and produce the maximum per man.

WHY THE UNITED STATES PRODUCES OVER SEVEN TIMES AS MUCH GRAIN AS EUROPE

The American farmer has recognized the value of power. Despite the lessening percentage of men working on the farm, every census except that of 1870 has shown larger percentage of increase in the number of farm horses and mules than in the total population of city and country combined. By the middle of the nineteenth century the ox had been practically discarded in favor of the more rapid horse. By the end of another half century each farm laborer has doubled his output. Strangely enough, but logically, this increase parallels the increase in animal power. Mulhall, in his Dictionary of Statistics (1900), states that, "In the United States 9,000,000 men raised nearly half as much grain as 66,000,000 men raised in Europe. Germany owned one-fifth as many horses as the United States for practically the same farm production. With the assistance of such a preponderance in power, the American farmer has been able to produce from three to three and one-half times as much as his competitor along the Rhine."

With the above facts in mind, it is

logical to assume that in order to maintain the standard of production on the farm in spite of the labor shortage, the unit of power per man must be increased. This can be brought about only thru the use of motor machinery. The tractor has taken a definite place in American agriculture. Some have expressed the opinion that the tractor would not be a success. We have read that certain conservative men in other days agreed that the binder, mowing machine, steam thresher and other labor-

were bought and used primarily as a substitute for horses. More recently the tendency has been to buy a tractor, not as a substitute for all the horses, but to supplement them in the rush seasons. The greater number of tractors is now bought by farmers who wish to have a large power reserve for the peak load of their work. The conservative manufacturers have given up the idea of completely motorizing the farms and are coming to look upon their machines as more properly supplementary and



A two-sawed motor cultivator, cultivating corn the first time thru

saving machines could not possibly be used with any degree of success. But the past three decades has proved that our modern farm machinery has far surpassed the fondest hopes of the inventor, and so it will be with the tractor.

LET THE TRACTOR SUPPLEMENT THE HORSE

Tractors are bought primarily for the personal use of the owner, rather than to be used in doing commercial work. In the early history of the tractor game the bulk of them went to the large farms in the West. Here they

reserve sources of power for use in connection with horses. The purchaser of a tractor who looks upon and uses his tractor in this light rather than in the former, will be less likely to be disappointed and will be more apt to be successful.

When the question arises as to the relative merit, economy, or efficiency of the tractor or the horse, the question must be settled in the light of local conditions. The farmer must not place too much faith in the results obtained by his neighbor who may have been success-

ful or unsuccessful with his tractor. His conditions might not be anywhere near the same. However, the experience of others under similar conditions will serve as a guide in estimating the possibility of his obtaining similar results with a tractor.

The personal element will enter largely into the matter of success or failure of the use of a tractor. One man will use a tractor either as his main source or as a supplementary source of power and make a financial success of it, while his neighbor, under similar circumstances, will undertake to operate his farm in a similar way and make a flat failure of it. In such cases it is generally found that it is not so much the matter of adaptability or its lack of adaptability, but the inability of the owner to use it to an advantage and operate it intelligently.

For a tractor to be used successfully on a farm of, say, for example, one hundred and sixty acres, there must be in many cases a rearrangement of the fields in order that the tractor can be used to its maximum advantage. Too many small or irregular fields are causes, generally capable of being remedied, which result in the waste of many valuable hours of time. A systematic planning of the season's work is essential. A farmer would not think of hiring additional horses without figuring beforehand just what they were going to do, so that his horses could handle the various jobs as they came up, with no lost time. It is the same with the tractor. A good plan is to make a work calendar for the season's work, writing down what the tractor should be doing each week and in what field, as plowing and tillage. Of course, this forecast work-calendar will not come out exactly so, but it will serve as a guide. It should be frequently con-

sulted, and then the time figured when "behind hand" work could be made up, figuring how, perhaps, by doing some other jobs first, more time will be gained than by doing the job planned for that week. It should be planned to prevent the tractor having two jobs at one time. Mistakes will be made, but one will learn a great many things never thought of before.

A great deal of ingenuity is needed in order that the horse-drawn implements, not including the plow, can be adapted to the tractor. A careful study of hitching the implement to the tractor will save much time in the long run, and will also increase the efficiency of operation of the tool. The overhead expense created by purchase of tractor tillage tools should be carefully curtailed by adapting the machinery already at hand to the tractor.

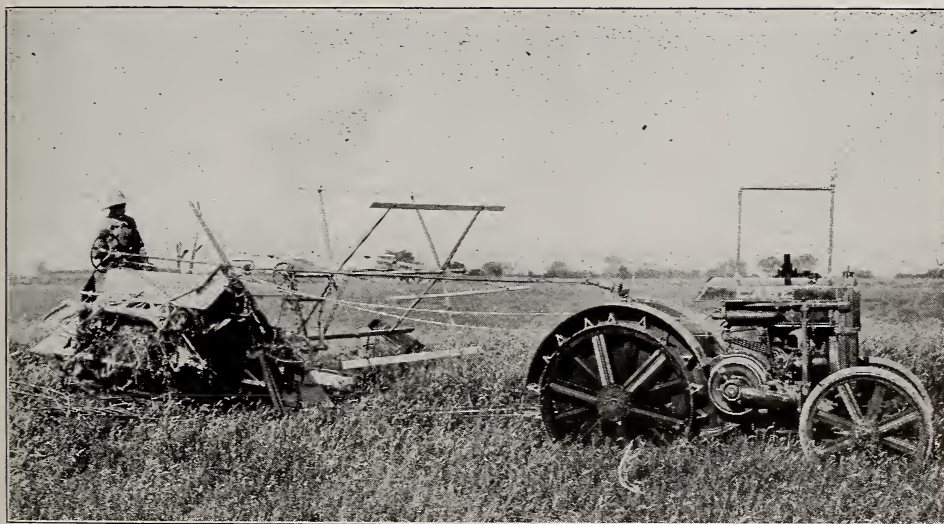
THE TRACTOR AS A TIME-SAVER

The tractor is the means of placing a large unit of power under the control of one man. The average sized tractors used on Ohio farms are the two and three-bottom rigs. With the two-bottom outfit, when used for plowing, the output of the man is more than doubled; and with the three-bottom outfit more than trebled, comparing it with a single-bottom horse-drawn plow. It has been my observation among the students that there is a relatively small number of farmers in Ohio who use the gang horse-drawn plow.

Another of the advantages of the medium sized tractors is that they give one man sufficient power to do two or more things at once, as well as do a large amount of one thing. Instead of plowing a large acreage in one day with the tractor, one can plow only a moderate acreage and, in addition, can disk or harrow it. This is one method of profiting by use of a tractor which

many owners have not yet learned. They do not take the fullest measure of the advantage offered to them by the available power of the tractor. The best time to harrow a piece of ground is while it is still moist and mellow after having been turned by the plow, and before the sun and the wind have had sufficient time to dry it out. This is especially true in spring plowing, when the moisture conserved by immediate harrowing will naturally assist in carrying

year. Delay of a day or so at this time can cut more and bigger slices out of the year's profits than can the same amount of delay at any other time of the year. This is the one time above all when nothing other than bad weather should be permitted to interfere with the work. One should be ready to meet any emergency. More horses give out or die from overheat and overwork during harvest than in any other season. If the tractor and hitch is ready



A four-wheeled tractor with special attachments for operating a binder

a crop thru a dry spell. Both experience and observations teach that one can go on any field and do any kind of work with a tractor when the soil is in fit condition to be worked with horses. To work a soil when it is too wet is folly. Many times we are forced to go onto the field with horses in order not to get too far behind with our work, but, with a tractor using combination hitches of disks and harrows, one can wait until the conditions are right and then force the tractor thru long days and complete the tillage in one operation.

Harvest is the critical time of the

to use on a moment's notice, it can be hitched to the binder when one or more horses give out.

Where the small grain acreage of a farm is small, or not large enough to demand more than one binder, it is quite probable that it will be best to count on the horses as the source of power. A tractor cannot be used very economically with one binder, when a man is required to operate the tractor and another the binder. However, there are some tractors that can be hitched to the binder and one man operate both machines. There are now upon the market some ingenious devices which

enable a man to use a four-wheel tractor with a binder or other harvest tools. When such a combination is used, the tractor can be used to a great advantage, as both time and labor are saved.

HOW LONG WILL THE TRACTOR LAST?

The average length of life of a tractor is hard to determine, as there are so many factors that enter into consideration. Some tractors, to my knowledge, have been in operation for five or six years and are still in good repair, while some have not stood the work thru a single season. The short life of a machine is due to two factors: (1) faulty design and cheap construction, and (2) ignorance on the part of the operator in giving it proper care. It was the privilege of one of the members of our department last spring, to observe two new machines of the same make in operation in fields not far apart. The first one was doing fine work, while the second one had been breaking a particular casting about once a day. On investigation it was found that the operator of the second machine insisted on doing things contrary to the instructions of the company. It would be but a short time until this machine would be in the scrap heap and tractors in general condemned by this particular man.

COST OF OPERATION

The cost of operation of a tractor for the different operations on the farm varies considerably. The fuel and oil costs for plowing with three different tractors on the University farm were:

9-18, two-bottom.....	24.4 cents
12-20, three-bottom	74.2 cents
9-16, two bottom.....	81.0 cents

conditions being practically the same.

A glance at the average fuel consumption tests made at the Marion County Tractor Demonstration, October 2 and 3, will give an idea how the

different type and sized rigs perform when the conditions are as identical as could be obtained in one 60-acre field.

Per A.		
(1) 1-cyl. Kerosene	\$0.673	2-bottom rig
(1) 2-cyl. Kerosene .....	.507	2-bottom rig
(2) 4-cyl. Kerosene .....	.504	2-bottom rig
(7) 4-cyl. Kerosene .....	.564	3-bottom rig
(1) 2-cyl. Gasoline .....	.795	2-bottom rig
(4) 4-cyl. Gasoline .....	.806	2-bottom rig
(1) 4-cyl. Gasoline .....	.675	3-bottom rig
(1) Ford Farm-A-Tractor .....	.842	1 16 in. bottom
Average of all kerosene rigs, \$0.562 per A.		
Average of all gasoline rigs, 0.779 per A.		

It is seen that there is a difference of 21.7 cents in favor of the kerosene machine, but, I venture to say that in a season's work the balance would be on the favorable side of ledger where gasoline was used. A gasoline motor does not require as much lubricating oil, nor does it carbonize as quickly. Less trouble will be encountered thruout the season when gasoline is used.

The average acreage plowed per hour for the two-bottom rigs was .672 A. per hour and .986 A. per hour for the three-bottom rigs, or an average of .331 acres per bottom per hour.

A survey of the different types of tractors, type of motor used, and the setting of the motor in the chassis gives one a fairly good idea of the trend of design. Of the 115 different machines now manufactured there are 16 of crawler or caterpillar type, 2 two-wheeled, 27 three-wheeled, 70 four-wheeled.

Ninety-one of these machines use the 4-cylinder motor, 21 use the 2-cylinder motor and 3 are single-cylinder machines. Sixty-eight place the motor in the chassis lengthwise, similar to an automobile, and forty-seven place it crosswise of the frame. It is then fair to conclude that the 4-cylinder, 4-wheeled is the leading type of tractor on the market.

HORSES ARE NEEDED

A great many of our horsemen seem

to have the idea that the draft horse industry is doomed. I do not believe it. The tractor on a farm will allow the farmer to sell his scrubs and geldings and keep good brood mares instead. This seems to be the logical thing to do, and instead, we will have fewer horses, but a greater number of good grades or purebred horses on our Ohio farms.

The number of failures of tractors so often sighted to us would at first lead one to believe that the tractor was a complete failure, but, on the other hand, when compared to the successful user the percentage is relatively small. The failures in many instances are due to lack of good judgment on the part of the owner or operator. He thinks it is a machine similar to a mowing machine and gives it mowing machine care, with disastrous results.

The leading thresher manufacturers inform us that the trend of the sale of threshing machines has gone toward the small individual sized machine which is used cooperatively by two or more farmers. This goes to show that the farmer is thinking seriously of using his tractor to its utmost capacity to secure the greatest returns possible on his investment.

In conclusion, let me ask that my



statements be not misconstrued, but think over the situation carefully—we are up against it for farm labor and the logical way to meet the situation is to place a larger power unit in the hands of the farmer in order that he may produce the maximum per man unit.

AN APPROPRIATE BIT OF VERSE

Our eyes were holden, so we did not see
The glowing beauty of the rip'ning
fields.

Immersed in books and marts, in
fashion's laws,

We went our way, purblind and
thoughtless, dull;

But when dread Hunger threatened all
the world

We waked, and now the millions on the
trains,

The throngs who tour the highways in
their cars,

All they who speed across the land, gaze
rapt

On fields, on orchards, as the fairest
sight

Descendants of the gardener Adam see.

The nation looks, spellbound, upon the
scene—

The countless fields, the growing grain,
strong men,

The sturdy beasts, the fruits—and feels
the thrill

Of man's world-old and bravest fight
for bread,

The ancient strife with hunger. Pride
and joy

We feel that now the barns again are
full,

The presses burst with grapes, the bins
all teem,

The fruit trees bend their heavy-laden
boughs,

And we and all the world may eat and
live.

—Calvin Dill Wilson.



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WAR AND THE AGRICULTURAL STUDENT

With this issue THE AGRICULTURAL STUDENT changes its staff. Mr. G. F. Johnson who started the year so well as editor is now enrolled in the S. A. T. C. Mr. C. H. Sprague, the Business Manager, is at Camp Hancock, Ga., Machine Gun Camp; Mr. O. J. Smith, the Circulation Manager, is not in the University this year. The publication, therefore, has fallen into the hands of several members of the faculty of the College of Agriculture. We hope to keep up the standard of readable and instructive articles and ask your heartiest cooperation. The editor would like to receive from you little stories of your experiences in the field of agriculture. Have you found out some new wrinkle

in raising pigs, or feeding poultry cheaply, or storing crops, or devised some method of marketing or made a labor saving device?

AUTUMN THOUGHTS

¶ Fall is here with its tonic air, brilliant foliage, bulging granaries, fragrant fruits, and lingering flowers. What thoughts come to us?

¶ Fall is the evening of the year, a time for reflecting upon our accomplishments; with pride upon our successes and with some disappointment upon our inability to do all that we had planned.

¶ Fall is here and we are glad to have lived during this romantic period when history transpires before our eyes.

¶ We are especially thankful for peace in this world of strenuous days, thankful that our Ohio boys have conducted themselves as heroically as the best; that the American troops have inspired Europe.

¶ We are grateful for the opportunities of universal service; that each woman may contribute her share to the comforts of her boy or some brother in the camps at home or across the sea; that every farmer may feel that he is usefully busy supplying food; that our boys and girls are learning in this busy hour to love the country which produces abundant crops and courageous men to nurture them.

¶ We are mindful of the wisdom, sincerity, admirable commonsense and diplomacy of our President who has placed us high in the estimation of the world as an industrious, principled nation when before we were judged as a commercial nation of hoarders and spendthrifts.

¶ We are thoughtful of the year and above every other thought we are thankful, nationally and individually, for opportunities and accomplishments.

PRES. THOMPSON RETURNS

Back home again after a stay of nearly three months in England and France, President Thompson says, "I have never been so glad to be at home here." President Thompson was accorded the honor of serving as President of the Federal Food Commission to Europe. In this capacity he has had unusual opportunities to study the agricultural conditions of the Allies.

President Thompson spoke before the faculty and administrative staff upon his interesting and busy trip.

He paid high tribute to the universal service of the inhabitants of the warring nations, and commended most highly the women, who have proved a great

success in the industries.

The great spirit of "Carry on" in all phases of agriculture and in the manufacturing was most impressive to him.

"England can not feed herself now and never could. The United States must send over food this winter, not only for the people but also for the livestock. The armistice will greatly change shipping conditions, but the feeding of the world will remain a great problem."

The French people, being great bread consumers, are in a difficult situation, in that 80 percent of the sugar factories and much of the wheat land is located in the devastated areas.

Enormous prices prevail for certain of the fruits and slightly luxurious food stuffs. The livestock situation is rather serious, due to the great loss by pillage of the Germans and the economic necessity of using the horses, cows, and other farm animals.

Optimistic of the results of the war, Dr. Thompson concluded by affirming his sincere belief that the war will bring about a greater understanding of the true meaning of the phrase, "The Fatherland of God and the Brotherhood of Man," a principle for which the United States has always stood and will continue to stand in the future.

THE AGRICULTURAL STUDENT will publish shortly a story of what the President saw in France and England—at this time we are merely welcoming him home.

Following the lecture the President and Mrs. Thompson were given a reception in the University Library. The Department of Horticulture transformed the library reading rooms and halls into a bower of palms and chrysanthemums. Prof. Harrington's student orchestra rendered music and a number of faculty ladies served refreshments.

BIG FOOD CAMPAIGN SET FOR THANKSGIVING WEEK

Nation-Wide Recognition to Be Given of Farmers' Achievements.

Thanksgiving Week in Ohio has been designated by Governor Cox for the rallying of all agricultural forces. "Ohio farmers have distinguished themselves this season," says the Governor. "Production of all staple food crops has been maintained and in some cases remarkably increased, in spite of an unheard-of labor shortage and of discouraging local weather conditions. I have learned directly that large increases over last year are being made in the number of hogs raised. Reports are coming to me constantly of men who have patriotically increased their wheat acreage from 5 to 50 percent. All elements of our population should, during Thanksgiving Week recognize the loyal services which the farmers of the state are rendering."

MUST FEED ENORMOUS ARMIES

The Governor has been advised that federal agricultural officials are preparing a national agricultural war program indicating the quantities of food which should be produced next season to support an army of 4,800,000 men in France. It is expected that in each state the agricultural college thru its extension service and including the county agricultural agents, will take charge of the campaign.

The College of Agriculture will be assisted by the following advisory committee of ten appointed by the Governor: Alfred Vivian, dean of the College of Agriculture, the Ohio State University, chairman; L. J. Taber, master of the Ohio State Grange, Barnesville; O. N. Sams, chairman of the agricultural committee of the Ohio Bankers' Association, Hillsboro; F. C. Croxton, federal food administrator for Ohio; N.

E. Shaw, secretary of agriculture; C. E. Thorne, director of the Ohio Agricultural Experiment Station; W. G. Farnsworth, president of the Ohio State Horticultural Society, Waterville; John F. Cunningham, editor of *The Ohio Farmer*, Cleveland; John Begg, Columbus Grove; and L. P. Bailey, dairyman, Barnesville.

In each county the program will be carried out by the county farm bureau, the official farmers' organization with which the United States Department of Agriculture and the College of Agriculture regularly cooperate.

FARM BUREAUS TAKE INITIATIVE

Already leaders in several of the 74 county farm bureaus are laying plans for pledging their members to a county agricultural war program for next season. Opportunity will be given every farmer to show concretely his support of the county program by joining his farm bureau during Thanksgiving Week. Every man who pledges his support of the National Agricultural War Program by joining his county farm bureau will be provided a membership button and a card to be fastened on his front gate.

At the close of the campaign on Saturday afternoon, November 30, farm bureau mass meetings will be held in each county seat at which the program of work for the county and state will be presented and adopted. Prominent public and agricultural officials will address the meetings.

O. S. U. WINS FIRST ON MILK

By making a score of 96.35 at the National Dairy Show last month at Columbus, the Ohio State University won the gold medal for market milk in the class open to colleges and experiment stations.

THE NATIONAL DAIRY SHOW

By R. B. STOLTZ

The Twelfth Annual Dairy Show held in Columbus, Ohio, October 10 to 19, was pronounced by many the most complete, instructive, and impressive exhibit of its kind.

The show had five distinct features, first, one of the greatest exhibits of machinery and supplies for the dairy-men; second, the exhibit of human welfare; third, the dairy product show; Fourth, the dairy cattle show; fifth, the horse show.

The dairy products show had the largest number of entries ever made in this department. In each class there was a gold medal awarded to the highest scoring entry and a silver medal awarded to the highest scoring entry from each state.

The gold medal for dairy butter was won with a score of $94\frac{1}{2}$ percent by Mr. Homer B. Gaul, who is now located at the Athens State Hospital, Athens, Ohio. Mr. Gaul graduated in the three years course in 1918.

Thru the efforts of the College of Agriculture there were eighteen entries of Swiss cheese from Ohio factories. These eighteen cheese weighed almost one and one-half tons. The gold medal in this class was won by Mr. John Lengacher of Dundee, Ohio, with a score of 96 percent. Mr. Lengacher attended the special dairy course in 1916 and was an assistant in the Dairy Department during the special dairy course in 1918.

The gold medal for the cottage cheese was awarded to the Younghurt Product Co. of Urbana, Ohio, and the silver medal was won by Harry Jones of the Athens State Hospital, Athens, Ohio. Mr. Jones graduated in 1914.

Gold medals for American brick and

Limberger cheese were won by men from Wisconsin. The other medals for butter were won by Illinois and Minnesota exhibitors.

The milk and cream exhibit was made up of one hundred and fifty-five entries. There were classes of market milk for colleges and experiment stations. The gold medal was won by the Ohio State University. The sample was prepared by Mr. C. B. Irwin of the Dairy Department. Mr. Cooley of the Wild Rose Farm, Mt. Vernon, Ohio, won the gold medal for market milk with a score of $99\frac{1}{4}$ percent. Mr. Cooley took a special Dairy Course at the University in 1915.

The United States Department of Agriculture in cooperation with the Ohio State University had a very instructive exhibit of the work done by Cow Testing Associations and Bull Associations.

Improved methods of harvesting and housing ice on a farm were shown and methods by which milk and cream could be cooled by spring water.

Miss Freeman of the Home Economics Department had charge of the Dairy lunch which was very popular with those who ate their lunch on the grounds.

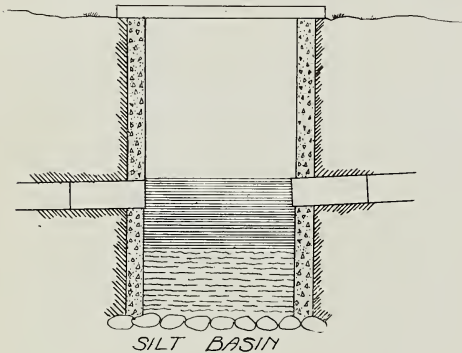
There were a great many alumni and ex-students of the College of Agriculture in attendance, among them were Orvil A. Jamison, '12, who is acting head of the Dairy Department of the Massachusetts Agricultural College, Amherst; Ralph R. Walker, '12; Robert Wiley, '16, Professor of Dairying of South Dakota Agricultural College; C. R. George, '12, Extension Department Purdue University; Samuel Guard, '12, Associate Editor of *The Breeders' Gazette*.

SILT BASINS

By C. H. SPRAGUE, '19

(Mr. Sprague is the retiring business manager of *The Agricultural Student*.)

The silt basin is a handy means of preventing the clogging of tile by the accumulation of silt at any point. One is usually installed where there is a change in grade from a higher to a lower fall, or where the movement of the water is insufficient to carry away the particles of silt. They may also be placed where a sub-main meets a main or where a lateral joins a main or sub-main. At these points a backwater occurs with deposits of silt which would clog the tile if not periodically removed. Silt basins when distributed over the



creted area break the system up into units, and if any of the tile become clogged this trouble can be quickly located. The bottom of the silt basin should be at least one foot and often it is as much as three feet below the lower edge of the tile entering the basin.

When the water enters the basin its velocity is greatly decreased. Hence the silt settles to the bottom of the basin while the clear water passes on thru the tile. When the basin has become filled with silt up to the edge of the tile, it should be cleaned out.

CONSTRUCTION OF THE BASIN

One of the most satisfactory methods of constructing silt basins is with con-

crete, altho those made with brick and a combination of brick and tile are popular. The basin should be made at least 15 inches square, as in the case of the one of concrete shown in the accompanying drawing. An opening is made to a depth of a foot and a half below the bottom of the tile and wooden forms made to fit. A 1-2-4 mixture of cement is poured between the forms and the walls of the opening. Generally one desires to build the wall even with the ground or a few inches above; but where the field is cultivated the walls may be stopped 12 inches from the surface. A strong wood cover is then placed over it and some special means of marking the location used.

LET THE TURKEYS GROW

The turkey is still a wild bird. All the efforts of the farmer and breeder have failed to domesticate this wanderer into a barnyard dependent that puts on fat at the whim of the owner. A chicken will put feed into fat at almost any age at any time if the crop is kept filled with the right kind of feed.

The young turkey, however, is a long-legged bug hunter until the winter thatch of feathers is put on and Nature suggests that it is time to store up a reserve for rigorous weather. Turkeys will put on weight rapidly and economically at that season, and raisers should take advantage of it.

This, too, is the season when fields provide plenty of feed that would otherwise go to waste and, in the case of weed seeds, would do damage to future crops.

Because of the diminishing of the herds, Europe will face serious food shortages for years.—*U. S. Food Administration*.

Home Economics Department

PRACTICE TEACHING IN HOME ECONOMICS

Under the Smith-Hughes Bill, Ohio State University.

By DORIS MACCONATHY, '17

The Smith-Hughes Bill, passed by Congress in 1917, provides for the appropriation of funds for vocational training. Part of this is devoted to Home Economics, a two-year course being given in cities of more than 25,000 inhabitants, a four-year course in those of less than 25,000. Ohio already has twenty schools where Home Economics is being taught under the provisions of this bill, the community furnishing the equipment, running expenses and part of the salary of the teacher, part of the salary being provided by the Smith-Hughes fund.

The bill further demands that all Smith-Hughes teachers shall have their practice teaching in a Smith-Hughes center. To meet this demand, Ohio State University has established two practice schools, one at North High School with a two-year course, and one at Reynoldsburg where a four-year course is being given. Over each school a critic-teacher has been placed and here the senior Home Economics students may do their practice teaching. These schools will also serve as models for the other Smith-Hughes schools of the state.

In the two-year course the student devotes one-half of her day to strictly Home Economics subjects, the other half to allied subjects and electives. In the four-year course, one-half of the day is devoted to strictly Home Economics subjects and allied subjects, the other half to electives. For example,

in a week, two ninety-minute periods are given to garment making, three ninety-minute periods to food study, two ninety-minute periods to design, three forty-five minute periods to civic biology, five forty-five minute periods to each of two electives, one of which must be English.

At Reynoldsburg, where the four-year course is being given, a house, located on the school grounds, is being used. Originally the house was a four-roomed colonial type, other rooms having been added, and offers many possibilities for remodeling. On the lower floor is a class room, opposite is a room which will be made into a dining room and directly back is the food laboratory. Beside the laboratory is a small room used as a pantry which has been equipped with running water. Upstairs is a room used as a sewing laboratory, a small fitting room and a large room which will be fitted up as a bedroom.

Offering the course in a house affords opportunity for solving real home problems and makes it more easily possible to link up the work of the school with the work of the home. Each girl will also carry on a home project under the instructor's supervision, which will further emphasize this relationship.

There will be problems in redecorating and furnishing the interior as well as improving the appearance of the exteriors. For the latter, we are looking to the boys who have been organ-

ized by the superintendent into a manual arts class. Under his supervision they expect to paint the house, design and build a colonial entrance and, with the help of some suggestive lectures from the University on landscape gardening, to beautify the

grounds with shrubs and flowers.

It is hoped, by those in charge, that this house will become a community center and that thru its activities the students will learn not only a daily lesson, but their place in and responsibility to that community.

HOME-MAKING EXHIBITS

The National Dairy Show, Columbus, Ohio.

By LOIS LAMPE, '18

(Such exhibits described by Miss Lampe will do much to increase the interest and importance of properly digestible and attractive food. The display was most dainty, educational, and appetizing.)

THE National Dairy Show was held at Columbus, Ohio, October 10 to 19, 1918. The Dairy Division of the Department of Agriculture cooperating with Ohio State University maintained four booths for the demonstration of the use and value of dairy products in the diet. The phases included were, (1) children's lunches, (2) food equivalents, (3) cottage cheese and modifications, (4) milk and cream in food preparations.

The demonstrations included all the parts of a four-course meal, and showed ways of using milk and milk products in soups, meat substitute dishes, salads and desserts. The object was to educate the people at large in the variety of ways of using milk in the preparation of food, and to stress the importance of the presence of milk in the diet. The demonstrations were conducted by the Home Economics Department of Ohio State University.

The booth which featured children's lunches comprised sample menus in the show cases, each of which was explained by placards. An adequate noon meal for the child of pre-school age was illustrated by the following menu:

(1) Eggs a-la-goldenrod, which contains protein, vitamins, minerals and fuel.

(2) Milk, which contains all the nutrients in the best form.

(3) Buttered carrots and peas, which furnish minerals, vitamins, fuel and bulk.

(4) Orange whip, which contains minerals, vitamins and carbohydrates.

The best types of lunch boxes and drinking cups were shown, also an example of a well-planned and a poorly planned lunch, including such a menu as milk, small cakes and sandwiches, put up neatly with oil paper in a lunch box. A hot dish for the school lunch was advocated, and it was shown by means of illustrations from Ohio schools, that hot soup or cocoa could easily be provided the children in most schools. The menu of the poorly-planned lunch comprised tea or coffee, bread and butter, pickles, fried sausage and pie. This lunch was done up in old bread wrappings.

Included in this exhibit was a suggested day's ration for a man at moderate muscular work, giving the caloric value, and proportion of protein, fat

and carbohydrate. In connection with the chart was a well-planned packed lunch.

The booth demonstrating food equivalents, contained displays explained by charts, which show the composition of food materials. Features in the exhibit were: (1) examples of foods high in the different nutrients, (2) 100 calorie portions of the common food food materials, (3) model menus.

The effect of diet upon the growth, development and physical condition of animals was illustrated by photographs of rats used in the physiological experiments of Dr. E. V. McCullom of Johns Hopkins University.

The use of cottage cheese and its modifications in the diet was demonstrated by a variety of prepared dishes. The list included soups, meat-like dishes, sandwiches, salads and desserts. The recipes used may be found in the food leaflet, "Cottage Cheese Dishes," Circular 109 of the United States Department of Agriculture, Washington, D. C. The directions for making cottage cheese in the home may be obtained from the United States Department of Agriculture, Bureau of Animal Husbandry, Dairy Division.

Five separate booths under the supervision of the Department of Home Economics showed ways of using milk and milk products other than cottage cheese in (1) milk soups and chowders, (2) meat substitutes, (3) creamed and escalloped dishes, (4) salads and desserts, (5) milk beverages.

Recipes for the different dishes were taken from "Milk Products Recipes," a bulletin put out by the National Dairy Association. This pamphlet was available for distribution in the building. The dishes were prepared in the booths by the demonstrators in charge

and displayed artistically arranged in show cases.

The class least familiar to the general public is milk beverages. This is one of the simplest ways of raising the milk consumption of the individual to the optimum amount, which is at least 1 quart a day for a child up to 6 years of age, 1 pint for a child from 6 to 12 years, and $\frac{1}{2}$ pint for an adult.

Some suggestions for milk beverages are cocoa, chocolate egg and milk shake, chocolate syrup, hot marshmallow chocolate, cocoa egg nog, and whey lemonade or punch.

A lunch counter under the direction of Miss Marie Freeman of the Department of Home Economics at Ohio State University was maintained. It illustrated to the public the many ways of including in meals the various dishes demonstrated in the booths. The lunches were typical examples of balanced meals and a charge of thirty-five cents per plate was made.

It has been the aim of the Home Economics Department of Ohio State University to aid the United States Department of Agriculture in informing the general public concerning the value of milk and milk products in the diet, and to assist in making known the most successful ways of preparing it for home use.

*Have You
Renewed Your
Subscription Yet?*

HOME-WELFARE NATIONAL FIGURES AT THE DAIRY SHOW

By LOIS LAMPE, '18

THE National Dairy Show was held October 10-19, 1918, at the Ohio State Fair Grounds, Columbus, O. The purpose, as outlined by the National Dairy Association, was to conserve and promote the child life of America by advocating a more extended use of milk and milk products in the home. The three agencies which planned and carried out the Dairy Show were the Dairy Division of the Department of Agriculture, the States Relations Service, and the Ohio State University.

The importance of food problems, and their bearing on the existing war program, is recognized. To use the words of Miss Mary Louise Arnold of Simmons College, "The American nation has a four-fold responsibility: we must see that our people are properly fed, we must find out what food is for, what types of food are most efficient and how much is enough."

To aid in the solution of these problems, an educational program for the National Dairy Show was arranged whereby the people were given an opportunity to hear and meet the leaders in this work. It may be of interest to our readers to have some definite knowledge concerning those speakers who have been prominent in Home Economics and allied work.

Dr. E. V. McCullom of Johns Hopkins University is a physiological chemist who has made an extensive study of the food requirements of man, and the nutritive value of the different types of foods. He has for some years investigated the vitamine contents of foods, and is widely known as "The Mineral Salts Man."

Miss Sarah Louise Arnold, of Sim-

mons College, has been prominent in institution work as a dietitian. She is one of the foremost leaders in Home Economics and is now with the Food Administration.

Miss Caroline Hunt of the United States Bureau of Agriculture is a dietitian specialist. She is a recognized authority in foods, and has done much to raise the standard of dietitian work in the United States. She was formerly connected with the University of Chicago, where she worked with Dr. C. F. Langworthy in the classification of foods.

Mrs. Ira Couch Wood is a member of the Welfare Committee of the Council of National Defense. She is a prominent Club woman of Chicago, and has done much toward the betterment of the hospitals in that city.

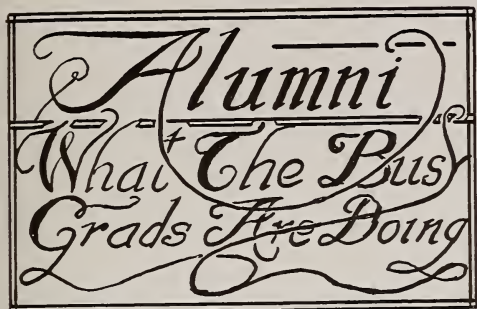
Mrs. Alice P. Norton is the editor of the American Journal of Home Economics. She was formerly connected with the University of Chicago.

Dr. Dorothy Mendenhall is now with the United States Children's Bureau. She was formerly connected with the University of Wisconsin.

Miss Emma Conley of the States Relations Service is the state leader of home demonstration agents. Previously she was at the University of Wisconsin.

America must prepare to rebuild the world's food supplies now that victory has brought peace.

If we save sugar by spoonfuls we can send it by shipfuls to "our boys" and our allies.



The "Busy Grad" section of THE STUDENT is the one in which the alumni and former students of our Agricultural College are most interested. Disappointment comes, no doubt, at times because the alumni notes do not contain as much information about your classmates and old college acquaintances as you would like to have. Do you realize that our ability to have a big and interesting collection of notes depends upon the extent to which you get into communication with us? Write to us telling where you are and what you are doing. Tell us about any of your classmates that you happen to know. It all goes to make up a big and interesting collection of "Busy Grad" notes.

We are proud to know that many of the Ag. men are now in the service of their country. They are often too busy to write us and have a larger task on their minds. May we ask the cooperation of the parents in this matter? Write us about your boys "over there." We are anxious to publish portions of their letters.

G. G. Trisler, '18, is sergeant in the forces overseas.

Donald B. Hussey, '17, has been commissioned First Lieutenant and is now in France.

P. H. McClure, '16, is now stationed at Ellington Field, Houston, Texas, in the aviation service.

Raymond H. Baldwin, '20, is now on the front line trenches. He writes that the sport is all lost because the Huns run away.

W. P. Elhardt, '18, writes that he has been wounded in the right arm and is in a hospital in France, where he is recovering nicely. He is, perhaps, the first forester to be wounded. Private Elhardt was in the 166th Inf. Band.

Harry F. Barnes, '17, is with the Headquarters Company of the Hospital Battalion No. 14 and is located at Camp Greenleaf, Fort Oglethorpe, Ga.

Lieutenant Wallace S. Erskine, '17, is with Ninth H. F. A. at Fort Sill, Okla.

John E. Hull, '17, is in France with the 334th Machine Gun Co.

Richard C. Fisher, '17, has been confined to B6 Base Hospital at Camp Upton, L. I., with the influenza.

Corporal Mark E. Simon, '18, is at Camp Sherman, 44th Co. 11th Training Battalion.

Matthew Walker, '18, is with the Amer. E. F. in France. He is in Co. K 54th Infantry Regulars.

Walter D. Hunnicutt, '17, is located in Wilmington, Ohio.

Sergeant Harold J. Marshall, '19, is with the Cooks and Bakers School at Camp Sherman, Ohio.

Lieutenant Robert W. Spear, '19, is overseas.

Lieutenant John J. Knidel, '20, was commissioned at Camp Sherman.

Miss Lela McGuire, '14, has accepted a position in the Department of Home Economics at Iowa State University. She was formerly an instructor in the same department at Ohio State.

W. H. Palmer is at the front in France. Mrs. Palmer (Orpha McCartney, '17) is a teacher of home economics in the Point Pleasant High School.



(The following letter is of unusual interest and describes making wine in France as well as a thrashing party. Prof. Paddock has received scores of such letters; we will publish others in early issues.)

Headquarters, 506th Engineers,
28th September, 1918.

Dear Prof. Paddock:

I received your letter and was glad to hear from you. I suppose by this time school is well organized and everything is going on fine and I hope that the new draft law will not decrease the number in college to any great extent.

The last time I wrote you it was just the beginning of the grape season. The grapes have now matured and are ready to be manufactured into wine. It is quite interesting to follow their manner of manufacturing the wine. First, the grapes are gathered mostly by women and children; each one takes a row and they are clipped off in bunches by a pair of scissors. They are then put into a container which the party carries along with him and then they are carried to the end of the row and there they are transferred to another person who has a container made to fit his back; and then there is placed at a convenient distance an ox cart drawn either by an ox or a cow. On this cart there is placed two large tubs with a ladder up the side so that the man who carries the container adjusted to his back can mount. He also carries in his hand a mallet. At this point he mounts the ladder and when in the proper position he leans forward, making an angle of about 45 degrees which allows the grapes to pour out into the tub. He uses this mallet to pack them. Now they are drawn by the animal from here to a building constructed something like our barns, but made of stone. Here they have vats in which the grapes are deposited. At this point a husky lad pulls off his shoes, rolls up his pants above his knees and washes his feet (we hope, altho we have never been able to see this process go on); then he climbs into the vat and with a continuous tread crushes the fruit until all the juice has been extracted. Then it is put in large barrels and allowed to ferment. This makes a very strong red wine which is diluted, when used. They also manufacture a white wine, which is made from white grapes; this is supposed to be of a much higher grade.

The grape vines do not seem to bear as well as ours. Most of the grapes are borne on the old stalk and at the bottom of the vine. I would say that each vine would average about twenty bunches of grapes, which is very low in my estimation compared with ours. The French-

men are very peculiar about their grapes. It is considered a very great offense for any one to steal a bunch of grapes in France, but they will give you all that you can eat and a few more, too, if you will ask for them. I know this from experience; the other day I happened to be where they were gathering grapes and they gave me as many as I could carry home and I ate so many that I do not care so much for them now as I did and you will know the reason why. They are nothing like as good-tasting grapes as ours. They are not nearly so sweet.

The workers put in full time in gathering. They go to work as soon as it is light and work until it is dark. Their main purpose seems to be to fill their containers, and when this is accomplished their day's work is completed.

The manufacture of wine seems to be the great industry in this section of the country. I do not quite see how they can live so well off the production, for it seems to take so many grapes to make a small quantity of wine and this wine is put up in bottles that will hold a liter, which is equal to our quart and this is sold two francs per liter or about forty cents in our American money.

I happened to be fortunate enough to be in a community where they were thrashing wheat. Their machines are made on the same principle as ours; in fact they use the English machine of the old type. They use practically the same arrangements as we use, but the method of handling varies a great deal from ours. The thrashing is done in a similar manner to the grapes—mostly by women and children, and is a very slow process. The wheat passes thru about five hands before it reaches the machine, and then it is put thru the machine without cutting up the straw at all and the head seems to be the only part that is affected. The straw comes out at one place and the chaff at another, which they are very careful to keep separate. At another place they have five spouts from which the wheat comes out. They let it run into sacks until the sacks are about filled, and then the sack is placed on the scales and weighed. It must weigh about seventy-five kilograms, which is equal to one hundred and fifty pounds in our weight. They also have a weight of five kilograms on the scales and this is the tax weight that each one is charged. As near as I could tell the wheat is raised on shares, for I noticed they put two sacks in the barn where they were thrashing, and one on the wagon, which was carried to another place.

They seem to follow that old method of having "big feeds" at these places where the thrashing is going on. At this particular place I spent quite a deal of time and when it came time for lunch I was invited in for dinner. On the table, which was about twenty feet long, was placed at intervals of about four feet large bowls of stewed chicken and between these bowls were placed large sized loaves of black bread; near the bread was placed large bottles of red wine. Between every other bowl was placed a bottle of white wine. They had a

combination salad, what it was composed of I was not able to tell. I was invited to sit down to dinner, but had to decline, as they had only one article on the table that I could eat, and that was chicken, and I hated to make my meal or dinner on chicken, so I told them that I had had a large dinner just a little while before and was not hungry. There was an absence of all formalities, not even a tablecloth on the table, but the table was very clean.

You will wonder how a soldier will have so much time on the farm but as you know, I am very much interested along that line and, therefore, spent the time allotted me for pleasure in studying and watching the French methods of farming. They seem to be crude and old-time, but nevertheless get results. They are very slow, but when a job is completed you can bet on its being well done. In all my traveling in France I have never seen a fence as yet. Stone walls are common, and the hedge is used to a great extent and, therefore, all the stock has to be guarded; and the women seem to pass their extra time out in the fields watching the sheep and cattle. They carry their lunch, which consists of bread and wine. They also take their knitting. The stock is kept up in good condition.

It is quite interesting to watch them handle their sheep. An old woman will have something like twenty-five to guard, but she is assisted by a dog. She goes ahead of the flock and the dog stays behind and they follow her better than I have seen a group of American children following their teacher, so this will give you some idea of how well they are trained. The cattle are trained in a similar way to the sheep. Many goats are raised in this country, to produce milk for making cheese. As you know, cheese is one of the main food products of France.

We have had some rainy days, but on the whole the weather has been very fine. Our boys seem to be in the very best of spirits and are trying to do their part, as you can see from the papers, where I guess you will get a much better idea of what is going on over here than I am able to write. We expect to keep on at it until the job is well done so that we will never have any more trouble with Kaiser Bill.

Well, I hope you will have a fine time, and find opportunity to write me some of the doings in and about the university, for we are always glad to have a word from our home land and especially from those we know.

Yours as ever,

DELBERT F. DUNLAP.

(Private Dunlap is one of the "Young Black Joes" doing good work for his country. The desire to establish true democracy in the world will accord the negro his just treatment after the war because of the heroic sacrifices made by this race.)

HAVE YOU RENEWED

Your
Subscription
Yet?

DO IT NOW.

ALUMNI NOTES (Continued)

E. B. Hawes, '13, is instructor in biology and military tactics at Sandusky High School.

Reed B. Dunn, '17, is teaching in the Bowling Green High School.

Miss Anna Bergman, '17, is teaching home economics in the Columbus High School.

Lieutenant Dexter N. Lutz, '17, has been transferred to Payne Field, West Point, Miss. Lieutenant Lutz received his ground training at the University of Texas and was commissioned at Scott Field, Belleville, Ills.

John Schaffner, '17, was married October 23rd to Miss Helen Davis, a

stenographer in the extension service at Ohio State. Mr. Schaffner is with the John Wildi Evaporated Milk Co., at Horseheads, New York.

Clark K. Brain, M. A., '12, is the entomologist in the Department of Agriculture, Pretoria, South Africa. He has published an extensive paper on the scale insects of South Africa in the Transactions of the South African Museum.

The farmer that's always kicking ain't got any real trouble on his mind. When real trouble comes he is generally too stunned to kick—*Adapted.*



Universal Service. By Liberty Hyde Bailey. New York: Sturgis and Walton Co, 1918, pp. XII+165. \$1.25.

The publishers of this book say, "Sooner or later the world war will end and the representatives of the nations gather to talk of peace. Here is a book that offers constructive suggestions for the remodelling of the social fabric."

Universal service means more than mere military service, as the author discusses it. He says, "Every man and woman will give of himself and herself, or the common opinion of mankind—which at the same time is the greatest punishment and corrective—will condemn him." It means that a man's primary obligation is to take care of himself, but in addition to this there is service in politics and there is great demand for help in welfare and betterment work of every kind and description, in city and country, religious and secular, industrial and literary, and in every way that a man or woman can give of himself or herself to another in the community.

Doctor Bailey makes some interesting suggestions for farmers in this little book. He expresses the hope that they will not be compelled to organize themselves defensively against other people, in commerce and politics. Referring to farmers he says, "Our best philosophy is to teach them; then let them apply it as they may, providing them the protections and supports that any good society should afford its citizens. Let government teach and safeguard the rural people, and then let these people very much alone."

He declares that he is in sympathy with all organization that aims at betterment and co-operative welfare, but is sorry when persons must combine to force advantages that should be theirs by right and public regulation. This doctrine should be understood by those who advocate organization as a panacea for all the troubles which arise in society.

The core of military service is personal participation and this must be applied in other public work. "The hope of humanity lies in universal service" is the closing sentence in this

interesting volume and it is a short statement of the central thought running throught the book.

We are in hearty agreement with a reviewer who says, "The book has more inspiration than information, but it is suggestive and worth while."

L. O. LANTIS.

Home and Community Hygiene. By Jean Broadhurst. Philadelphia: J. B. Lippincott Co. 428 pp., 118 illustrations.

Dr. Broadhurst has written a readable book, whether for the general reader, the teachers of school hygiene or home economics, the nurses, or the health officials. It is thoroly up-to-date with its chapter on Military Hygiene. It gives a concise statement of the role of bacteria in our everyday life of health, as well as disease, and discusses sanitation as applied to the home, school, public gathering, rural problem, and civic carelessness.

Food values, adulterations, inspection and preservation are discussed. The importance of preventive methods for controlling the spread of disease as related to personal caution, refuse disposal, quarantine, vaccination, and community water supplies, is carefully emphasized.

A list of problems follows each chapter, which in most cases are as interesting, instructive, and suggestive as the text which precedes them. For example,

"It has been well said that most of the observances called 'good manners' have hygienic significance, e. g., covering the mouth when coughing. How many other instances can you find?"

"What mechanical devices can you suggest for decreasing opportunities for transfer of disease (e. g. doors opening by foot devices instead of handles)?"

"What sanitary measures would make an epidemic of typhus fever impossible in your city? Of smallpox?"

"What provisions regarding racks for towels, wash cloths, tooth brushes and soap should be made in boarding houses, if the members use a common bath room?"

These are only a few of the pertinent constructive questions asked.

Dr. Broadhurst writing of the reduction of the amount of meat eaten says,

"Cows should be used for milk and not for meat; a cow in good condition will give in one year milk containing as much protein and two and one-half times the number of calories as are contained in her own body."

Dr. Broadhurst impresses us with the idea that we are responsible for the most sanitary conditions possible in our community. She causes us to acknowledge, with some shame, our lack of information regarding the actual hygienic conditions among which we live. We are our brother's keeper in respect to infant welfare, transfer of disease, good sewage disposal, tuberculosis control, airy schools, clean food as affected by stores and restaurant inspection, sane marriages, unadulterated drugs and food, together with the many other hygienic factors which make the world a pleasant place to live.

A. C. H.

MINNESOTA FARMER PLOWS BOTH DAY AND NIGHT

L. S. Thom is a Minnesota farmer who believes in plowing early and deep. His crops were coming along fine when a hailstorm beat them down, but undaunted, he started in immediately to re-plow his ground to put in a second crop. In order to get his crop in as early in the summer as possible, before harvesting began in his vicinity, he ran his 8-16 Avery tractor outfit with a headlight in the front and one in the back, continually, eight days and nights, stopping only for fuel and water, until his work of plowing was done. (See illustration on contents page.) He realized quick action was needed and by running in shifts the work was accomplished with the aid of his tractor in short order.

He started out the previous year and says, he plowed eighty acres of the hardest plowing he had ever seen, pulling three 14-inch bottom plows 6 inches deep. Another time he pulled a potato digger, and in the forenoon of one day gained seventy-two rod runs on the horses. He also hauled 3500 bushels from the field to the cellar, a distance of about $1\frac{1}{2}$ miles, four loads at a trip with 90 bushels to the load, or 360 bushels in a trip. At another time he pulled a 15-inch Ohio cutter, filling two 150-ton silos in six days, these silos being 40 feet high.

This was just some of the work he accomplished in the first sixty days that he had his tractor last year. The silo filling could not have been done by horses.

Mr. Thom says a man can farm cheaper and more successfully with a tractor than with horses, and is also relieved of having so much hired help about the place.

He reported some actual figures on

the cost of this work with the tractor, and what the probable cost with horses would have been. He said if he had done this same work with horses, it would have cost him $2\frac{1}{2}$ times as much as it would with motor power. The tractor would haul four loads of potatoes from the field to the root cellar at noon, while the horses were eating, and again at night when the horses were taken to the barn for rest. He could not have plowed his land at night after the hail had destroyed his crops, if he had used horses, but by using his tractor he got in his second crop in time to allow a good growth before the heat and burning sun of the dry summer season.

Every farmer knows the value of plowing deep and early to conserve the moisture. The slogan, "Work Will Win the War" was surely lived up to by this man.

The Machine That Farmers Everywhere Have Been Waiting For



The Jeffrey Limepulver Junior

Illustrated above will grind any dry friable material, such as Limestone, Marl, Oyster Shells, for Agricultural Lime; Corn, Shells, Charcoal, etc., for Chicken Feed; Snapped Corn, Ear Corn, Shell Corn, Oats, Velvet Beans, and all sorts of seeds, for stock feeding; Alfalfa, Hay, Pea Vines, etc., to meal for Protein Feeds.

Write for full particulars.

The Jeffrey Manufacturing Co.

507 N. Fourth Street, COLUMBUS, OHIO.

Live Agents Write

OFFICE MACHINERY ON THE FARM

By OTTO J. SMITH, '19

(Mr. Smith is the retiring circulation manager. The attractive placing of a desk will often determine the amount of bookkeeping and reading done by the farmer. It should be well lighted and undisturbed by the family.)

Usually when we speak of machinery on the farm we think of heavy farm implements of various kinds, such as tractors and grain binders, or other labor saving machines in the field. On a very few farms some consideration is given to office machinery, but this is undoubtedly the most neglected side of the equipment on the average farm. And there is no place in which a limited investment can be made to yield better returns.

It is not necessary that every farm have an office, but every farmer should have a well equipped desk of his own. This desk should be conveniently arranged, so that its surroundings will invite the farmer to sit down and attend

to his accounts and correspondence, even after a hard day's work in the field. It gives the farmer a definite place in which to keep his records and correspondence, and tends toward promptness in business transactions.

Along with the desk should be found a set of record and account books, writing materials, and plenty of scratch paper or pads for figuring. Neat well-printed letterheads form a valuable addition to the equipment and are relatively inexpensive. A typewriter adds neatness to the correspondence and gives a more businesslike letter. Any one can operate a typewriter and a neatly typewritten letter on a well printed letter head certainly gives your correspondents a much better opinion of your business, than an illegible pen-written letter on a piece of tablet paper.

When considering farm equipment, let us not overlook the office machinery. It need not be elaborate, but should

What A "Ready" Ration Means

A "ready" ration is a feed that is delivered to you ready to be placed in the feed boxes. It is a feed that will save grain for you—an important service now when grain is so urgently needed for food and when the prospect for cheap grain is so doubtful.

A "ready" ration is the most efficient and economical feed for the most efficient and most economical of all food producers—the dairy cow.

INTERNATIONAL Ready Ration

is a paying ration. It is a clean feed prepared in clean mills, from ingredients that contain all the essential elements to keep cows fit and maintain maximum milk production.

All these benefits are yours in this ration which saves you all the mixing, all danger from poor quality ingredients, all waste of needless ingredients or wrong combinations.

Try it. If your dealer can't supply you, we will.

**INTERNATIONAL
SUGAR FEED
COMPANY**
Minneapolis,
Minn.



consist of a convenient desk, typewriter, well-printed letter-heads and stationery, and a good set of record and account books. This much is needed on every farm and will do much to add both pleasure and profit to the business.

GLENDALE GARDEN CLUB AND PIGGERY ASSISTED

Abandoned Attempts at Gardening to Raise Corn and Hogs.

Assistance has been given to many war emergency crop production attempts. One of interest is that of the Glendale Garden Club and the Glendale Piggery.

J. J. Buchenal of Glendale had purchased a tract of approximately twenty acres near Glendale, on which it had been expected that two residences would be erected. With the opening of the war he changed his plans and turned the land over to a representative group of citizens of Glendale for a community garden project. Some food was produced, but altogether the project was not a success. The plot was of rather large size and it was found not to be the best soil for garden purposes.

The persons sponsoring the project counseled among themselves and also consulted the county agent. The county agent advised that more food could be produced if the land were put into corn and farmed in the ordinary way. He also suggested that the corn could be fed to pigs.

The land was planted to corn and the citizens interested decided to feed the corn to pigs. Thirty members of a new organization known as the Glendale Piggery got under the project. The pigs were bought from Frank Rossetot, one of the county farm bureau members. Arrangements were made with him to raise the corn on shares, to raise the pigs and to feed the pigs the share

of the corn belonging to the garden club raised on the twenty-acre tract. Forty pigs, nearly two months old were bought for \$7.50 apiece. Mr. Rossetot was also paid for their care and feed until the new corn was available. The corn was recently harvested. Between four and five hundred bushels of it belong to the garden club.

The pigs are still being fattened and the project has not been completed, but with a fair market price it is expected that the community effort will net a goodly sum for war relief purposes.

Next year wheat will be raised by Mr. Rossetot on the twenty-acre tract on shares.

Mrs. A. M. Allen of Glendale, one of the most enthusiastic boosters of the movement, says that the slogan of the piggery is "More Food for Animals and More Animals for Food."

COST OF COW TESTING PAID HANDSOME PROFIT

Records Sell Valuable Stock of S. B. Bowles, Harrison.

That cow testing association records may be of vital financial benefit to a dairyman can be no better illustrated than in the case of the Jersey herd of S. B. Bowles, living northeast of Harrison. Dairying is only a side-line on Mr. Bowles' one hundred and forty acres, but a profitable one.

By studying his cow testing association records Mr. Bowles has been carefully building up his herd. He has weeded out his poor animals and, of course, kept his good ones.

As a result a dairyman from an adjoining county, attracted by the records of Mr. Bowles' herd, bought five of his cows for \$125 each. To this price was added the sum of \$15, which represented the total cost of testing all his herd. Again the buyer came back the

next time to secure two heifers at \$75 and \$90 each. Again the owner added the cost of the cow testing records. In his sales Mr. Bowles has disposed of his older stock and developed heifers. Six have made records high enough to place them in the advanced registry class this year. One not quite two years old produced one hundred and forty-six pounds of butterfat in one hundred and fifty-two days. Altho the best cow in the herd, it took records to prove it. She was not thought such.

A part of Mr. Bowles' corn was hogged down. He also uses self-feeders and during the winter he feeds a bunch of light stocker cattle. He feeds clover hay and works his straw and corn fodder into these cattle as well as some of his corn.

By proper arrangement of his farm work Mr. Bowles puts in three hundred and thirty-three man hours per month on the farm, the average number of man hours in the neighborhood being two hundred and fifty. He keeps a man nine months of the year. This man drives a four-horse team at field work while Mr. Bowles is giving his attention to the livestock and general operation of the farm.

Plans for a water system and for a self-feeder for hogs were furnished thru the farm bureau.

HESSIAN FLY IN WHEAT

Hessian fly is appearing in early-sown wheat, according to Professor W. E. Hanger of the College of Agriculture. It is particularly noticeable in fields visited in southwestern Ohio. While the fly may not do considerable damage to the wheat over the state next season, Professor Hanger points out

that, as its prevalence seems to run in cycles, farmers will do well to watch this pest and take proper precautions in planting next fall.

The fly is frequently seen on plants having one or two slightly yellow leaves. If these are stripped down it is likely to be found either in the larvæ or flaxseed stage in the leaf sheath. Most of the flies are now in the flaxseed stage.

CHAMPION CORN RAISER

James B. Appel of Lucasville, Scioto County, is the only person to be elected this year to the One Hundred Bushel Corn Club of Ohio. Mr. Appel raised an average of 101.93 bushels of corn to the acre on ten acres with the yield reduced to a uniform moisture content of 20 percent. The percentage of moisture in Mr. Appel's corn was 23.6 percent.

This is the fourth man to have this honor conferred on him by the Ohio State University College of Agriculture. The others are E. L. Johnson, Painesville; Richard E. Simmonds, Cleves; and E. J. Riggs, Gallipolis. The highest record is held by Mr Simmonds with an average of 102.64 bushels.

Contestants for this honor are members of the Men's Ten-acre Corn Contest conducted by the College of Agriculture. The purpose is to promote the average corn yield of the state.

The state champion will receive a cup and each of the county champions gold medals. These will be presented in person by Dean Alfred Vivian of the College of Agriculture during the seventh annual Farmers' Week to be held at the Ohio State University, Columbus, from January 27 to 31.

UTILIZING SOFT CORN

As the husking season approaches, it may be well to remember that each year a large amount of soft corn is raised. We should consider how this corn can be best utilized, when feeding stuffs are so high priced.

In general this corn, due to its soft condition, is not marketable and I have known some farmers, who grade their corn in the field, to leave it out-of-doors the entire winter.

At our home we have always been able to utilize all the soft corn for winter feeding very economically.

Since the cobs have some nutritive value, under some conditions cows are able to consume them without grinding. Soft corn when fed to dairy cows with or separate from the ensilage, provides a valuable concentrated feed.

A small amount fed with the roughage keeps the male of the herd in good condition.

If the farmer is wintering some feeding steers we have always found that good gains are made very cheaply with soft corn as a feeding constituent. Experts have demonstrated that for steers a pound of dry matter in soft corn is equal in feeding value to a pound of dry matter in mature corn.

We have never used soft corn to any extent in feeding hogs, but many breeders believe they can obtain more value when fed to young pigs, than with mature corn, but as it contains less starch it should not be used for a finishing feed.

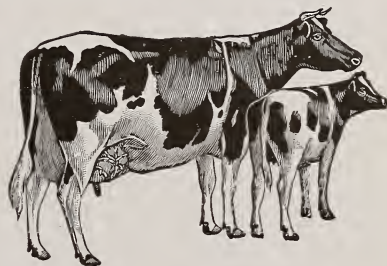
It is well to remember that best results are obtained in handling soft corn, by feeding it in the winter as fermentation is less likely to take place.

MERRITT E. JONES, '19.

How Much Does the Average Person Know About Milk

Let us send you a 32 page booklet on the subject from a Holstein viewpoint. It will tell you the comparative cost and food value of various articles of food, variations in fat content and character; illustrations of fat globules in Holstein, Jersey, and human milk; Dr. Thomas Morgan Rotch's views on the Holstein, the most perfect milking animal known having every characteristic of a cow suitable for an infant's milk supply; the experiments at Storrs' in feeding milk rich in fat to livestock.

Send postal today for a copy—it's free.



Holstein - Friesian Association of America
F. L. HOUGHTON, Sec'y.
Holstein Building, BRATTLEBORO, VT.

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The Rich Golden June Color

—BY—

CHR. HANSEN'S DANISH BUTTER COLOR

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Chr. Hansen's Laboratory, Inc.,
Little Falls, N. Y.

Western Office, Milwaukee, Wis.

FARM BUREAU ACHIEVEMENTS IN HAMILTON COUNTY

Offered the first completely organized means for securing local cooperation in setting improved agricultural practices at work. The farm bureau has 1,000 members.

Saved thousands of dollars to truck growers in 1917 thru spraying demonstrations to rid tomatoes of plant lice.

Stimulated the use of 2,500 tons of home-ground limestone.

Introduced four portable lime pulvers.

Assisted in all war money-raising campaigns.

Given counsel and assisted in general direction of several community attempts at war efforts to supply farm labor.

Obtained data for use of draft boards and other state and federal agencies.

Started a community tiling project northeast of Harrison that will increase production on many a loafer acre.

Conducted spraying, pruning, and fertilizer demonstrations in orchards.

Assisted in the organization of cow testing associations.

Stimulated interest and enrollment in Boys' and Girls' Clubs conducted by the College of Agriculture.

Conducted county five-acre corn contests.

Secured plans of farm buildings from the Agricultural College Extension Service.

Encouraged purchase of tractors, where it seemed advisable, by holding tractor demonstrations.

Introduced better dairy stock

Helped secure more satisfactory adjustments in the price of milk.

Helped stamp out hog cholera by vaccination demonstrations.

Helped farmers to secure acid phos-

phate, nitrate of soda, and other fertilizer when needed and at favorable quotations.

Organized county horticultural and crop improvement associations.

Given counsel to farmers regarding personal problems.

Cooperated with the threshermen in getting uniform scale of threshing prices.

Saved \$2,000 worth of wheat by cooperating with the threshermen and farmers in getting canvass placed under their machines to eliminate waste in threshing.

MORE PRO-GERMAN RUMORS

Malicious rumors have been reaching the College of Agriculture at Columbus to the effect that the government intends to requisition or confiscate a certain portion of the food canned in the homes. Another rumor states that home canned food is to be heavily taxed by the federal government. Both are declared to be unfounded according to state and federal officials. On the contrary the government wishes every person to store up as much food in the home as possible by means of home canning and thus insure an adequate supply of food for reconstruction needs.

MORE WHEAT THRU LIMING

William Yeager of Sharonville had a twenty-acre field of wheat which had never been limed and which yielded from eighteen to twenty bushels an acre, sometimes twenty-five bushels.

Limestone, ground on the farm by a portable crusher, was applied at the rate of two to two and one-half tons per acre at the suggestion of the county agricultural agent. The wheat yielded forty bushels per acre this season.

DANCING

Emerson Academy

High and Warren

Margaret Naddy Turkopp extends to the faculty and students of Ohio State University and their friends a most cordial invitation to attend her Academy of Dancing.



The Art of Dancing gives to every student that happy combination, an educated mind in a graceful body, thus every student should determine at once to round off college life by attaining proficiency in dancing during this season. Pupils may arrange for either private or class lessons according to their own desires, while the regular Assembly Nights are for all who know how to dance.

Pupils should not be satisfied to learn only the Waltz, Two-Step and One-Step, but should enter an advanced class and learn the beautiful Spanish Waltz, Bugle Trot, Six-Step, Fox Trot and Sweet Sixteen.

CALENDAR FOR 1918-1919

Advanced Class—Mondays and Wednesday, 7:30.

Beginners' Class—Tuesdays and Thursdays, 7:30.

Assembly—Fridays and Saturdays, 8:15.

(Friday Assembly is for young people only.)

Afternoon Class—For Young Folks—Date to be announced later.

Private Lessons by appointment.

Masquerade Party—Thanksgiving Night, Nov. 28.

As the above calendar will be followed during the entire season all interested in dancing should cut out this page and reserve it for future reference.

For information pertaining to classes or assembly, call the phones given below and all questions will be cheerfully answered.

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Seeing Us for

Dry Cleaning

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Uniform Fit

Neat Appearance Helps
a Lot.

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At 12th Ave.

Pencils, Pens, Box Paper, Foun-
tain Pens, Jewelry, Repair-
ing, Umbrellas.

GARDEN PESTS DESTROYED BY FALL CLEAN-UP

War gardeners will find it profitable to burn the remnants of old crops together with weeds and filth along fencerows so that injuries from insects and plant diseases may be lessened for next year, according to entomologists at the Ohio Experiment Station.

Insects hibernate in crop residues to a great extent but burning and clean culture will destroy a greater portion of the adult pests including the potato stalk borer, asparagus beetle, squash weevil, cabbage louse, striped cucumber beetles, squash bugs, onion thrips, stalk borers and radish maggots.

During the fall months much of the rubbish may be piled for a week or so until it dries thoroly; during the drying period it will serve as a trap, as many insects will seek shelter with the approach of colder weather. The vines gathered may also contain many hibernating insects, their immature stages or even eggs, which will be destroyed when the crop residues are burned.

Fungus diseases of potatoes, peas, celery, cucumbers, tomatoes, onions and melons generally live over to the next season on old plants and of course begin to multiply rapidly as soon as conditions are favorable. Burning and cleaning up will tend to prevent an early start at least of these organisms.

APPROVED SIZE FOR MARKET

The U. S. Food Administration suggests that in order to take advantage of this favorable season for putting on gains that no young turkey hens weighing less than six pounds dressed should be marketed. Young gobblers should be of sufficient size to dress at least eight pounds before being sold. Let the turkeys develop and grow fat.

APPLES FOR A PURPOSE

Housewives should give some attention to the variety of apples selected for home use if the best results in fruit conservation are to be secured, according to the Department of Horticulture, Ohio Experiment Station. Some varieties are adapted particularly for cooking, some for dessert, and some have better keeping qualities than others. A few varieties will fit a number of purposes but many housewives are now listing apples according to their needs and keeping qualities.

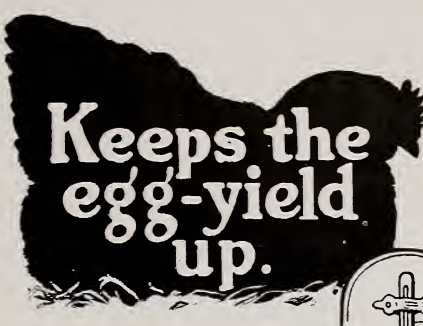
The Rambo, Northern Spy, Rhode Island, Grimes Golden, and Winter Banana are listed by the department as varieties adapted for culinary purposes; these will keep under cellar storage conditions until January 15. For dessert purposes during this period the Delicious, Jonathan and Grimes Golden are named.

Varieties adapted for cooking which will keep through the early part of March are: Baldwin, Jonathan, York, Rome Beauty, Winesap, Hubbardston and Roxbury Russet. Apples good for dessert during this period are: Stayman Winesap, Rome Beauty, White Pippin and Baldwin.

Ben Davis, Gano and Black Ben are better for early spring use than at any other time; these varieties are never recommended except for late apples as a long storage period is necessary to bring out their good qualities. As late apples they are adapted for either eating raw or for cooking.

When it is finally decided that a thing is impossible—watch some fellow do it!
—*Kiwanis Hornet*.

It is impossible to over-produce any line of essential food.—*U. S. Food Administration*.



Keeps the egg-yield up.

The best known poultry experts and most successful poultry raisers are agreed that hens can be made to lay heavily in winter, by feeding them a balanced ration, providing an abundance of white-forming elements.

Experiment Station tests in many different States have shown that

Purina Chicken Chowder with Purina Scratch Feed,

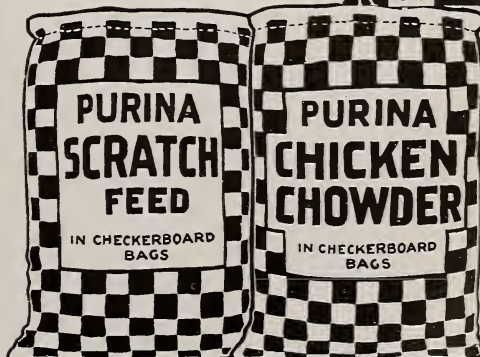
together, form such a perfectly balanced ration. Hens fed grain alone make excess yolks, which cannot be laid. Corn, oats, barley, wheat, etc., are yolk-forming and fattening feeds, and should be balanced with high protein ingredients to produce as many whites as yolks. Purina Chicken Chowder contains such white-forming ingredients as granulated meat, linseed flour, alfalfa flour, etc., that balance the grains in Purina Scratch Feed.

According to one high authority on poultry feeding "poultry raisers must appreciate and realize the necessity of protein in the ration to produce the white of the egg." Ordinary grains do not contain enough protein. Purina Chicken Chowder contains an abundance of digestible protein in a highly palatable form.

Write us today for further information regarding Purina poultry feeds. 64 page Poultry Book furnished free upon request.

PURINA MILLS,

St. Louis, Mo. Buffalo, N. Y.
Sold only in checkerboard bags.



(Continued from Page 152)

Some lines should be four rods apart. In other places, eight rods is sufficiently close together. The difference is not the result of a guess. Sandy subsoils can be drained as well with lines eight rods apart, as can the tight soils with lines four rods apart. Furthermore, lines of tile four feet deep and eight rods apart are generally as efficient as lines of tile three feet deep and four rods apart in the same soil. If a man is draining for a corn field he needs the lines of tile four rods apart, while for a meadow of timothy and alsike, eight rods apart would be sufficient. Where a spring makes land wet, try to get a line of tile laid to cut off the water before it bubbles out at the spring. Put a line of tile at the edge of the marsh to cut off the millions of little springs caused by seepage from the upland. These are factors to be considered, not guessed at.

There is no excuse for having to guess at the location of a line of tile ten years after it is laid. An accurate map should be made as soon as the work is completed. The simple plane table is a convenient device for such a map. Any instrument with a horizontal circle for measuring angles makes accurate mapping possible. These devices are particularly needed where the system must necessarily be

irregular, and for which a map is most necessary. The map need not be elaborate, but accuracy and convenience are essential.

APPLE SHOW

The eighth annual Ohio State Apple Show will be held in Toledo, December 6-14, in conjunction with the National Farmers' Exposition. Premiums aggregating \$1,800 will be awarded. Any apple grower in the state of Ohio is eligible to enter displays without an entry fee. It is anticipated that this show will be even superior to the shows held in former years in point of quality, quantity and decoration. The Ohio State Horticultural Society which fosters this show is one of the oldest agricultural organizations in the state. It was organized as the Ohio Pomological Society in 1847, and is composed of the most progressive fruit growers in the state.

Premium lists may be obtained from Prof. Robert B. Cruickshank, Secretary, Department of Horticulture, Ohio State University.

The Hampshire-The Vigorous Hog

Why not grow the thrifty, disease resisting hog, **THE HAMPSHIRE?** They are rustlers, easy feeders, and the packers choice. Now breeding sows and gilts. Spring boars from choice sows of wonderful size and bone. An Edgewood Guarantee is Gilt Edge.

DEPEW HEAD, EDGEWOOD FARMS, Marion, O.

All Seniors and other organizations should come in early for their sittings.

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Where Good Sows and Good Boars Meet

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2 Miles from Black Lick.

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"STATE" JEWELRY

Anticipating the Holiday Season which is just around the corner, we're showing many interesting, attractive and useful things especially designed for gift purposes.

PILLOWS in pelt and leather, PENNANTS and BANNERS

At prices that are sufficiently varied to meet every one's requirements.

THE H. K. SMITH CO., 11th Avenue & High

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Highest quality—
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WHAT VALUE HAVE LEAVES?

When the leaf falls from the tree it has given up its principal food to the branches and roots of the tree, but it has not lost its value. Rotted leaves or leafmold is one of the oldest and best fertilizers used by gardeners, for it not only enriches the soil but gives to it a fine loose texture which is ideal for plant growth. Garden soils of the rawest and poorest conditions will show much improvement next spring if a quantity of leaves is spaded in this fall. Old gardeners treat a strip of ground in this day each fall, on which to grow the most delicate vegetables the next year.

When leaves are raked up in the fall they should be dumped on the garden, or better still, piled up with a small amount of manure. This will form a compost of the richest kind after the leaves have rotted. The compost is spread thinly in the rows when planting spring crops. Mixed with an equal quantity of earth, it makes the best potting soil for house plants and for use on flower beds. Leaves from trees along the street should always be raked up and used by gardeners in the neighborhood, and forest leaves should be collected wherever available.

Burning leaves destroys their value to make the soil friable.

WEIGHT COMPARISONS

Now, when we have need for every ounce of food that can be put into form for human consumption, whether ground by mills or gizzards, it is the soundest economy to let the young turkeys live thru the fall bug-and-seed-hunting season.

A young gobbler that weighs ten pounds in October will weigh twelve or thirteen sixty days later if given a little extra feed along toward the end of that period. A hen in the same time will fill out from seven pounds to nine or ten. Such satisfactory gains can be made at no other time in the bird's life. It is the season when Nature is preparing for winter. The turkey hasn't learned to depend on the farmer's grain bins.

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General Hardware and Sheet
Metal — Manufacturers of
Special Laboratory
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Clean, Wholesome, Well-Served Food, ^{PRICES} **REASONABLE**

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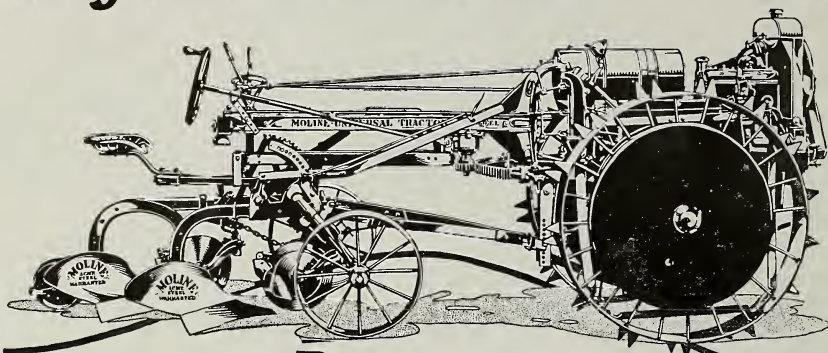
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You may not be able to get a Moline-Universal if you delay ordering.

You will help relieve spring congestion of shipping by buying now.

You will have plenty of time to become familiar with its construction and operation before the spring rush and will be able to work your tractor in on belt work and other light jobs.

It is the only tractor which does all farm work including cultivating.

One man operates both tractor and implement where you must sit in order to do the best work.

Tractor and implement form one unit—backs as easily as it goes forward—turns in a 16-ft. circle.

It has plenty of power for your heaviest work, yet light in weight to operate economically on light jobs. All the weight on two big drive wheels—no dead weight—no extra expense.

Substantially constructed for many years of service.

Electric lights for night work and self starter for non-robust labor.

You can practically double your efficiency—you can produce more food with less help. You will need it, order now.

Write today for full information and name of your nearest Moline Dealer. Address Dept. 85.

Moline Plow Co., Moline, Illinois

MOLINE

UNIVERSAL TRACTOR





Look Ahead a Few Months

You remember last winter when the snow was deep and the railroads were blocked, what difficulty many farmers and dairymen had in securing feed for their stock. Avoid a repetition of a similar condition this year by urging your customers *to order their feed supply now.*

In our big advertising campaign in the farm and dairy papers we are urging feeders and breeders to place their orders with their dealers early. We are also explaining to them the advisability of ordering the kind of feed that will best meet the requirements of their farm stock.

Help Yourself—Help Your Trade

by making your store the headquarters for SCHUMACHER FEED and BIG "Q" DAIRY RATION—the feeds that, because of their merits, have become the choice of the majority of farmers and dairymen.

SCHUMACHER FEED—the "old reliable"—has been the standby of feeders for years. Make it YOUR leader. It is the best-known and largest-selling feed in the world. Your customers will find it not only the best feed for dairy cows (when fed with protein feeds), but also ideal for hogs, horses and all farm animals.

BIG "Q" DAIRY RATION stands at the head of high protein mixtures. With SCHUMACHER it makes the winning combination for both feeders and dealers. Dairymen can save the labor of home mixing by feeding SCHUMACHER and BIG "Q" in combination and have a more uniform ration—one that assures them maximum milk production.

Your customers want SCHUMACHER FEED and BIG "Q" DAIRY RATION. If you are not handling them you are losing the biggest and best part of the feed trade. Write for our attractive proposition to dealers.



The Quaker Oats Company

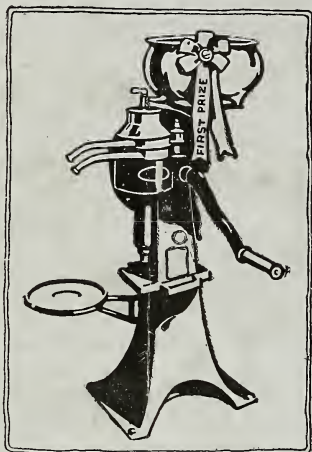
Address: Chicago, U. S. A.

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SCHUMACHER FEED & BIG "Q" DAIRY RATION



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A PRIZE WINNING
CREAM SEPARATOR

THE DE LAVAL CREAM SEPARATOR

Is a Winner

Why don't you let it win for you?

AT the great national and international expositions, the juries have invariably acknowledged the superiority of the De Laval. They awarded the Grand Prize, the highest possible award, to the De Laval at the Panama-Pacific Exposition at San Francisco in 1915, as also at Buffalo, Chicago, St. Louis, Paris, Brussels, and all the great world expositions for more than 35 years.

What the world's greatest dairy experts, the men who operate the creameries and the big milk plants and dairies, think of the De Laval is best evidenced by the fact that 98% of the cream separators in use in such plants the world over are of De Laval make.

De Laval Produced Cream Makes Best Butter

Since 1892 the National Buttermakers' Association has held butter-scoring contests each year in connection with its Annual Convention, and at every such convention butter made from cream separated by a De Laval Separator has scored highest. This is 100% record for the De Laval. No room for chance there. Only unusual merit made such a record possible.

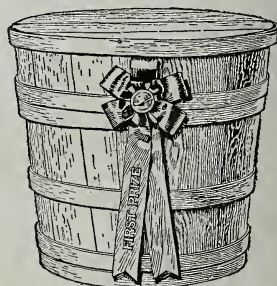
Proof of the superiority of De Laval Separators and of De Laval produced cream has been piled up and multiplied so many times that it is no longer questioned. It is an accepted fact.

THE DE LAVAL SEPARATOR COMPANY

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EVERY NEW DE LAVAL HAS
A BELL SPEED-INDICATOR



A PRIZE WINNING PRODUCT

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